CHAPTER 3.0

Environmental Setting and Impacts

3.1 Aesthetics

3.1.1 Introduction

This section describes existing conditions and potential impacts on aesthetic resources as a result of construction, operation, and maintenance of the project. Visual or aesthetic resources are generally considered to be the natural and built-in features of the landscape that are visible and that contribute to the public's experience and appreciation of the environment. Visual resource or aesthetic impacts are generally defined in terms of a project's physical characteristics and potential visibility and the extent to which its presence will alter the perceived visual character and quality of the environment.

This study also addresses the California Environmental Quality Act (CEQA) Guidelines for visual impact analysis. Significance criteria for determining impacts to aesthetics, as set forth in Appendix G of the CEQA Guidelines, are presented in Table 3.1-1. Potential aesthetic impacts are discussed in Section 3.1.2. Impacts to aesthetic/visual and scenic resources from the project will be less than significant. The applicant-proposed measure (APM) AE-1: Nighttime Lighting to Minimize Potential Visual Impacts, described in Section 3.1.4.2, will further reduce the project's less-than-significant aesthetic impacts**.**

TABLE 3.1-1
CEQA Checklist for Aesthetics
PG&E Embarcadero-Potrero 230 kV Transmission Project

I. AESTHETICS **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☑
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☑	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☑	☐

3.1.2 Regulatory Background and Methodology

This section describes the regulatory background relevant to the project area as well as the methodology used to estimate aesthetic impacts.

3.1.2.1 Regulatory Background

Federal or Federal Delegation

There are no federal regulations or delegation of authority applicable to the project related to aesthetic or visual resources.

State or State Delegation

California Scenic Highway Program

California's Scenic Highways Program, a provision of the Streets and Highways Code (S&HC), was established by the Legislature in 1963 to preserve and enhance the natural beauty of California. The State Scenic Highway

System includes highways that are either eligible for designation or designated as scenic highways. The status of a state scenic highway changes from "eligible" to "officially designated" when the local jurisdiction adopts a scenic corridor protection program, applies to the California Department of Transportation (Caltrans) for scenic highway approval, and receives the designation from Caltrans (Caltrans, 2009). A city or county may propose adding routes with outstanding scenic elements to the list of eligible highways. However, state legislation is required for a highway to be officially designated.

No designated state scenic routes are located near the project. Highway 280, an eligible state scenic highway, lies 0.35 mile to the west; however, intervening buildings generally screen views of the site from this roadway.

San Francisco Bay Conservation and Development Commission (BCDC), San Francisco Waterfront Special Area Plan

The McAteer-Petris Act of 1965 established the BCDC in part to regulate filling, dredging, and land use and to improve public access along the San Francisco Bay. It regulates nearly all work on the land within 100 feet of the Bay shoreline. BCDC is also the federally designated state coastal management agency for the San Francisco Bay segment of the California coastal zone. Although the switchyard site is located just outside the BCDC jurisdiction, the provisions from BCDC's San Francisco Waterfront Special Area Plan (SFWSAP; BCDC 1975) that relate to visual resources along the San Francisco shoreline are considered in this discussion. In particular, that plan contains the following provision:

> *7. View Corridors. Important Bay views along The Embarcadero and level inland streets should be preserved and improved. Minor encroachment into the view corridors from level inland streets may be permitted under the following conditions:*
>
> > *a. where the encroaching element has a distinct maritime character, is separated from the shoreline by water, and adds variety to the views along the waterfront;*
> >
> > *b. where minor structures (such as kiosks) are desirable to provide public amenities contributing to a continuity of interest and activity along the waterfront;*
> >
> > *c. where essential maritime facilities cannot reasonably be located and designed to avoid view blockage. (p. 11)*

The switchyard site is located approximately 350 feet from the shoreline and outside the jurisdiction of BCDC's SFWSAP. With respect to views toward San Francisco Bay, the project will not encroach upon existing view toward the Bay and therefore conforms to this plan.

Port of San Francisco

By virtue of the Burton Act, the State of California delegated authority to the Port of San Francisco (see Section 3.10, Land Use). The Port of San Francisco is responsible for 7.5 linear miles of waterfront, piers, and adjacent seawall lots in San Francisco. In the project area, the Port has jurisdiction over the Bay and certain onshore lands in the vicinity of Pier 70 and Warm Water Cove. Because the switchyard site is located in proximity to the Port's Southern Waterfront Subarea Plan and the area encompassed by the Pier 70 Preferred Master Plan this discussion considers relevant Port policies.

Port of San Francisco, Waterfront Land Use Plan

The Waterfront Land Use Plan contains general policies to expand visual and physical public access to the Bay. In particular, the plan states the following:

> *10. Major developments on waterside properties should highlight maritime features and incorporate public access improvements which maximize visual connections (and physical contact, to the extent possible) with the water as further described in the Waterfront Design & Access Element. (p. 68)*

Because the project will not interfere with existing or future public access or views toward the waterfront, it conforms to policies of this plan.

Port of San Francisco, Waterfront Design and Access Element

The Waterfront Design and Access Element provides additional policies for the design of new development, including policies on public access, views, and historic preservation. Appendix A of the Plan, Street View Inventory, shows existing and proposed views of the Bay from waterfront streets. It recommends that streets that connect to the waterfront should have views of the Bay, historic structures, or architecture that provides a waterfront identity.

This map does not show 23rd Street as having an existing or proposed Bay view the project conforms with this element.

Port of San Francisco, Pier 70 Preferred Master Plan

As part of development at Pier 70, located northeast of Potrero Switchyard, the Port intends to create Slipways Park, a new waterfront open space due east of Irish Hill at the eastern edge of the pier. The park may include jetties or piers for pedestrian access to the waterfront and public access from the extension of 20th and 22nd Streets. Additionally, the plan envisions future public shoreline connections from Slipways Park south to Warm Water Cove Park.

The project lies outside the planning area for the Pier 70 Preferred Master Plan. Furthermore, as presented in Figure 3.1-3B in Section 3.1.4.5, the project will not substantially affect views near the site, where potential future public shoreline access could occur. Consequently, the project does not conflict with this policy.

Local

Because the California Public Utilities Commission (CPUC) has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local discretionary regulations. This section includes a description of the local regulations relevant to the visual resource issues associated with the project and is provided for informational purposes to assist with CEQA review.

The project is located in the City of San Francisco adjacent to areas cooperatively administered by the City of San Francisco, the Port of San Francisco, and the BCDC. This section reviews visual resource-related policies and regulations contained in plans of that agency.

City of San Francisco, San Francisco General Plan

The San Francisco General Plan contains ten Area Plans that set specific policies and guidelines for certain neighborhoods in San Francisco. The project area is located within the area described in the Central Waterfront Plan. Additionally, provisions in the Recreation and Open Space Element of the General Plan pertain to visual resources.

City of San Francisco, Central Waterfront Area Plan

The Central Waterfront Area encompasses Mariposa Street south to Islais Creek and Interstate 280 east to the Bay (San Francisco Planning Department, 2008). The Built Form and Streets and Open Space sections of the plan contain provisions pertaining to visual resources in the area, as follows:

3. Built Form

> *OBJECTIVE 3.1. Promote an urban form that reinforces the central waterfront's distinctive place in the city's larger form and strengthens its physical fabric and character*
>
> *POLICY 3.1.1. Adopt heights that are appropriate for the Central Waterfront's location in the city, the prevailing street and block pattern, and the anticipated land uses, while producing buildings compatible with the neighborhood's character.*
>
> *POLICY 3.1.2. Development should step down in height as it approaches the Bay to reinforce the city's natural topography and to encourage an active and public waterfront.*

In relationship to adjacent development, the height of the proposed Potrero 230 kV Switchyard is relatively low and will not interfere with views toward the waterfront. In addition, the project's appearance is in keeping with the primarily industrial character of the immediate vicinity. Therefore it conforms to the Central Waterfront Area Plan policies.

POLICY 3.1.5. Respect public view corridors.

Once constructed, the project will not block views down 23rd Street, toward the waterfront.

POLICY 3.2.3. Minimize the visual impact of parking.

The new switchyard will include access from 23rd Street; however it does not involve permanent parking that will be visible to the public.

POLICY 3.2.6. Sidewalks abutting new developments should be constructed in accordance with locally appropriate guidelines based on established best practices in streetscape design.

The project will include a visual screening gate and wall with vines along the public sidewalk and street frontage; therefore it is in conformance with Policy 3.2.6.

5. Streets and Open Space

This element describes the expansion of Warm Water Cove and the development of Crane Cove Park, to be located east of 18th Street on Pier 70. Additionally, as part of a long-term plan for the Potrero Power Plant site and Pier 70, the area surrounding Irish Hill is also identified as a potential park site. Currently, this area is owned by PG&E and is used for company operations. The area surrounding Irish Hill also provides alternative locations for Potrero 230 kV Switchyard (see Section 5.0, Alternatives). The plan describes 22nd Street and 24th Street as future green connector streets to waterfront open space, and 23rd Street as an improved pedestrian connection.

OBJECTIVE 5.1. Provide public parks and open spaces that meet the needs of residents, workers and visitors.

POLICY 5.1.1. Identify opportunities to create new public open spaces and provide at least one new public open space serving the Central Waterfront.

OBJECTIVE 5.3. Create a network of green streets that connects open spaces and improves the walkability, aesthetics, and ecological sustainability of the neighborhood

POLICY 5.3.1. Redesign underutilized portions of streets as public open spaces, including widened sidewalks or medians, curb bulb-outs, "living streets" or green connector streets.

POLICY 5.3.2. Maximize sidewalk landscaping, street trees and pedestrian scale street furnishing to the greatest extent feasible.

POLICY 5.3.4. Enhance the pedestrian environment by requiring new development to plant street trees along abutting sidewalks. When this is not feasible, plant trees on development sites or elsewhere in the plan area.

The project will include a visual screening gate and wall with vines that will enhance the pedestrian environment along 23rd Street.

Recreation and Open Space Element

In addition to the relevant neighborhood plans, the Recreation and Open Space Element of San Francisco's General Plan includes policies that pertain to the project area. The project will not substantially affect views from these areas (refer to Section 3.1.3.2). Therefore it conforms to policies in this element.

City of San Francisco 49-Mile Scenic Drive

I-280 and a portion of Indiana Street, near the project, are part of San Francisco's 49-mile Scenic Drive. The drive was developed in 1938 as part of the Golden Gate International Exposition. San Francisco Travel, the official tourism marketing organization for the City and County of San Francisco, promotes the drive, and it is marked by signs maintained by the City's Department of Parking and Traffic (San Francisco Travel, 2012).

Although the drive is recognized for its aesthetic value, no specific City plans or policies address scenic resources for this portion of the roadway corridor. Because the project is consistent with the surrounding area's existing

industrial character and because views of the site are generally screened by intervening buildings, the project will not represent a noticeable change and therefore will not affect motorists' views from this drive.

3.1.2.2 Methodology

The proposed project described in Chapter 2 includes a new Potrero 230 kV Switchyard and a 230 kV transmission line connection between Potrero Switchyard and Embarcadero Substation. Once constructed, the transmission line would be either submarine or located underground and will not be visible to the public or affect existing visual resources. Therefore, the transmission line components of the proposed project are not addressed further in this section. Instead, this section focuses on the construction and operation of the new Potrero 230 kV Switchyard described in Section 2.4.4.

The visual analysis is based on review of technical data including proposed project maps and drawings provided by PG&E, aerial and ground level photographs of the proposed project area, local planning documents, and computer-generated visual simulations. Field observations and photography were conducted in May and June 2012 to document existing visual conditions in the proposed project area and to identify potentially affected sensitive viewing locations.

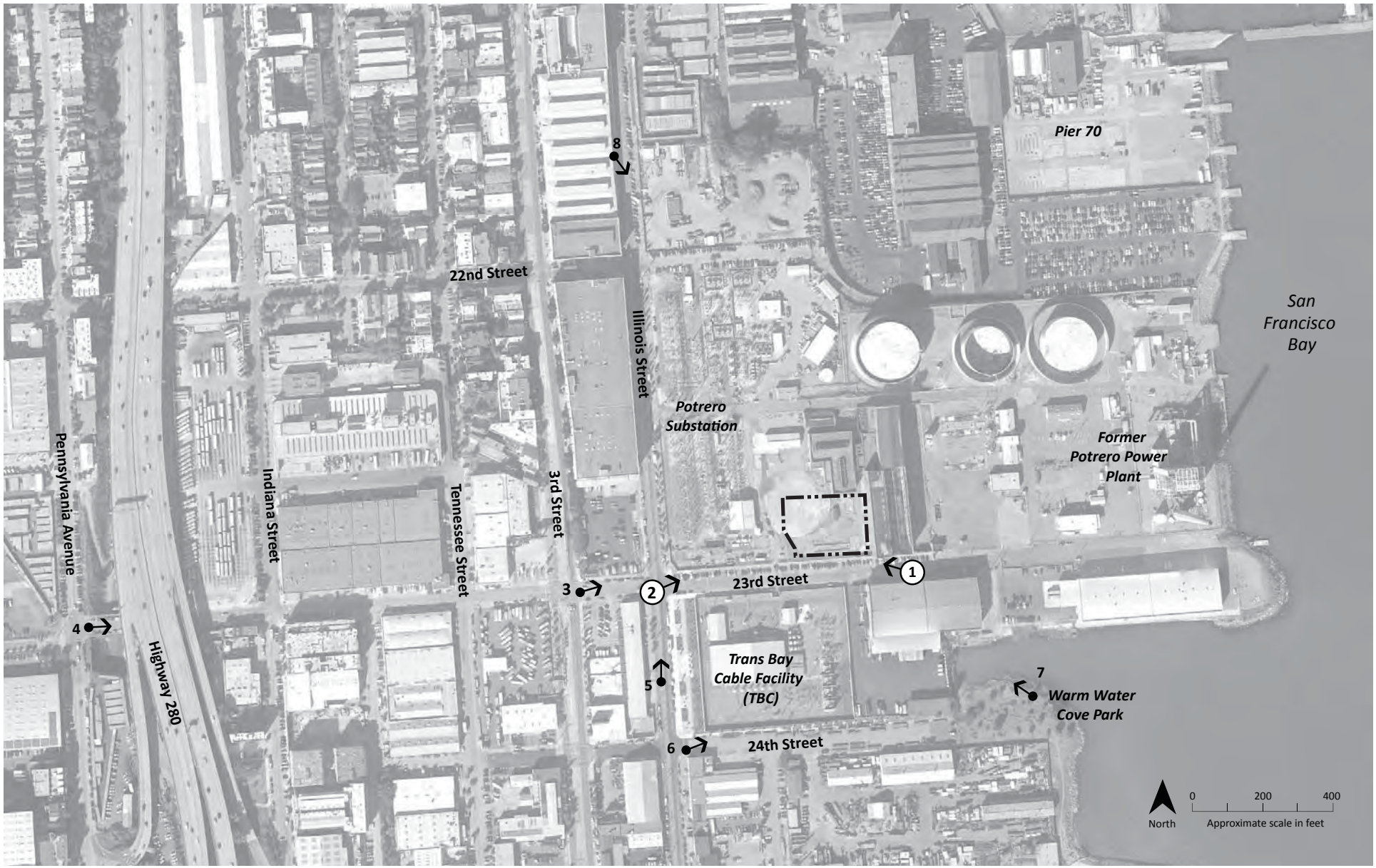
As part of the aesthetics analysis, a set of visual simulations were prepared to illustrate before and after visual conditions in the proposed project area, as seen from key representative public viewpoints or key observation points (KOP) (see Figures 3.1-1 to 3.1-4 in the subsections that follow). Two vantage points have been selected to represent close range public viewing locations, where the project would be most visible. The simulation photographs were taken using a digital single-lens reflex camera. One of the simulation photographs, Figure 3.1-4 in Section 3.1.4.5, employed a "normal" 50-millimeter (mm) equivalent lens, which represents a horizontal view angle of approximately 40 degrees and the other uses an equivalent 35 mm lens that represents a wider angle view, approximately 54 degrees, to portray the project at close range within its urban landscape context. The simulation methods employ systematic computer modeling and rendering techniques.

Digital aerial photographs and project design information supplied by PG&E provided the basis for developing a three–dimensional (3-D) computer model of the new switchyard components. For each simulation viewpoint, viewer location was input from global positioning system data, using 5 feet as the assumed eye level. Computer "wireframe" perspective plots were overlaid on the simulation photographs to verify scale and viewpoint location. Digital visual simulation images were then produced based on computer renderings of the 3-D model combined with digital versions of the selected site photographs. The simulations are presented in Figures 3.1-3 and 3.1-4 in Section 3.1.4.5; each of these figures consists of two full-page images designated "A" and "B," with the existing views shown in the "A" figure and the after visual simulations in the "B" figure. Discussion of these simulations is also included in Section 3.1.4.5.

This visual assessment employs methods based, in part, on those adopted by the Federal Highway Administration (FHWA) and other accepted visual analysis techniques. The impact analysis describes change to existing visual resources and assesses viewer response to that change. Central to this assessment is an evaluation of representative views from which the project will be visible to the public. To document the visual change that will occur, visual simulations presented as before and after images show the project from key representative public viewpoints. The visual impact assessment is based on evaluation of the changes to the existing visual resources that will result from construction and operation of the project. These changes were assessed, in part, by evaluating the after views provided by the computer-generated visual simulations and comparing them to the existing visual environment.

3.1.3 Environmental Setting

Figure 3.1-1 is an annotated aerial photograph that shows Potrero Switchyard in its urban landscape context. The switchyard lies in the eastern part of San Francisco within a predominantly industrial setting. The site is located near the waterfront and approximately 2 miles south of the City's downtown district. Two regional freeways, Interstate 280 (I-280) and Highway 101, are a third of a mile and just under 1 mile to the west, respectively, and



Source: Environmental Vision, 2012.

LEGEND

1 → Viewpoint Location and Direction

2 → Simulation Viewpoint Location and Direction

New Potrero 230 kV Switchyard Site

FIGURE 3.1-1
Photograph Viewpoint Locations
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

provide connections to the southern peninsula and locations beyond. A local street grid provides access to the project area. Topography in the immediate area is relatively level, and the site lies at approximately 20 feet above sea level. Rising to an elevation of about 300 feet, Potrero Hill is a residential and commercial district that lies approximately 0.5 mile to the west, on the opposite side of an elevated portion of I-280.

The project site is on 23rd Street, east of Illinois Street and approximately 400 feet from the shoreline of San Francisco Bay. Approximately 150 feet east of the site the street dead-ends and there is no public access further east, including to the waterfront. In the immediate vicinity, industrial and warehouse facilities and utility structures are established urban landscape features, including the adjacent Potrero Switchyard (which includes the existing 115 kV Potrero Switchyard), the decommissioned former Potrero Power Plant, several overhead power lines, and the recently built Trans Bay Cable (TBC) facility, the latter directly across 23rd Street from the site.

The site is southwest of Pier 70, part of the Port of San Francisco's working waterfront. While the area immediately adjacent to the site is characterized by industrial activities, such as cranes, large buildings, and other port facilities, the area located west of Third Street consists of residential, commercial, and public uses including new development. The street has been recently developed as a light rail corridor with improved transit stations and streetscape amenities. The corridor provides a major local connection between the City's downtown and southern neighborhoods. Residential development comprised of both new construction and renovated industrial buildings has increased along the corridor and to the west.

3.1.3.1 Project Viewshed

The project viewshed is defined as the general area from which a project is visible or can be seen. For purposes of describing a project's visual setting and assessing potential visual impacts, the viewshed can be broken down into foreground, middleground, and background zones. The foreground is the zone within a quarter-mile to a half-mile from the viewer. Landscape detail is most noticeable and objects generally appear most prominent when seen in the foreground. The middleground is a zone that extends from the foreground up to 3 to 5 miles from the viewer, and the background extends from about 3 to 5 miles to infinity (Smardon et al., 1986).

For the purpose of this analysis, the potential effects on foreground viewshed conditions are emphasized, particularly those areas within 0.25 miles of the switchyard site. As seen from many locations within the surrounding area, it is anticipated that views of the proposed switchyard site will be partially or fully screened by intervening structures.

3.1.3.2 Visual Character and Representative Views of the Proposed Project Area

This section describes existing visual character found in the project area. Figure 3.1-2 presents a set of eight photographs that show representative visual conditions and public views within the area. Figure 3.1-1 delineates the project and photograph viewpoint locations.

The site occupies approximately 1 acre adjacent to the existing Potrero Switchyard, northwest of the intersection of 23rd and Illinois Streets. While views are available from places along 23rd Street, open views toward the project site tend to be localized within a block or approximately 500 feet of the project site. Longer range views are substantially screened by intervening structures.

Photograph 1, a close-range view from 23rd Street approximately 150 feet east of the project, shows the site beyond the chain link fence. A brick warehouse on the right (north) and the canopy of another structure on the left (south) frame the view and a pole-mounted overhead light lies within the project site. The existing Potrero Switchyard is visible directly beyond the site. Farther away, street trees along 3rd Street and a multi-story building are partially visible and Potrero Hill appears in the backdrop, including trees and residences on the hillside.

1. 23rd Street east of Illinois Street looking west*

2. 23rd Street at Illinois Street looking northeast*

*Simulation Viewpoint

Refer to Figure 3.1-1 for viewpoint locations.

Source: Environmental Vision, 2012.

FIGURE 3.1-2
Sheet 1 of 4
Photographs of the Potrero Switchyard Site
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

3. 23rd Street at 3rd Street looking northeast

4. 23rd Street at Pennsylvania Avenue looking east

Refer to Figure 3.1-1 for viewpoint locations.

Source: Environmental Vision, 2012.

FIGURE 3.1-2
Sheet 2 of 4
Photographs of the Potrero Switchyard Site
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

5. Illinois Street near 24th Street looking north

6. 24th Street at Illinois Street looking northeast

Refer to Figure 3.1-1 for viewpoint locations.

Source: Environmental Vision, 2012.

FIGURE 3.1-2
Sheet 3 of 4
Photographs of the Potrero Switchyard Site
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

7. Warm Water Cove Park looking northwest

8. Illinois Street north of 22nd Street looking southeast

Refer to Figure 3.1-1 for viewpoint locations.

Source: Environmental Vision, 2012.

FIGURE 3.1-2
Sheet 4 of 4
Photographs of the Potrero Switchyard Site
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

Photograph 2 is a view from the 23rd and Illinois Street intersection that shows part of Potrero Switchyard, including a metal building and a gray concrete wall bordering the sidewalk, in the foreground on the left. Beyond the switchyard the project site is visible along 23rd Street with a multi-story brick industrial building seen in the backdrop. To the right, the stack of the former Potrero Power Plant appears silhouetted against the sky and part of the landscaped TBC perimeter wall is visible along Illinois Street.

Photograph 3 is a view looking toward the project site from the crosswalk at 23rd and Third Streets, an active pedestrian area. Similar to Photograph 2 in composition and character, this view also shows the site located in the vacant area in front of the red brick warehouse. In addition this view includes utility poles and a light colored low rise storage building situated along the south (right) side of 23rd Street as well as an open view toward the East Bay in the backdrop. Photograph 4 is a view toward the site from approximately 0.4 miles west along 23rd Street at Pennsylvania Avenue just west of I-280. From this slightly elevated viewing location, the site is discernible but substantially screened by intervening buildings. Photograph 5, taken from Illinois Street between 23rd and 24th Streets shows development along both sides of Illinois Street. On the right, Potrero Switchyard is a prominent feature, seen above a light gray wall, and, in the immediate foreground, recently installed landscape improvements and the TBC screening wall are adjacent to the street. Multi-story buildings appear on the left. Utility poles, street trees and a distant high-rise building are also visible against the sky. This portion of Illinois Street connects to the Bay Trail shoreline access. Taken from Illinois Street, Photograph 6 is a view looking southeast along 24th Street in the direction of the project site and the waterfront. This location is one block away from the project site, and views toward the site are completely blocked by the masonry walls visible in the foreground that surround the TBC facility poles and structures within the TBC facility and the more distant stack of the former Potrero Power Plant appear silhouetted against the sky. Trees situated within Warm Water Cove Park are visible at the end of 24th Street and a green and yellow sign that denotes Bay Trail shoreline access can be seen on the right side of the street.

Photograph 7, taken from the waterfront path in Warm Water Cove Park approximately 600 feet southeast of the site, shows that views toward the project are completely screened by the storage building on 23rd Street across from the site. Open, panoramic views of the ay are available to the east from this location along the shoreline path; however, buildings, tanks, utility towers and various other industrial structures dominate views in other directions.

Photograph 8, from Illinois Street north of 22nd Street, is a view looking toward the site. Opaque fences and intervening buildings at or near the existing Potrero Switchyard generally screen views of the project from this area. Utility structures, including lattice towers and portions of the existing Potrero Switchyard, are visible silhouetted against the sky. On the left side of this view Irish Hill, a partially vegetated landform with exposed rock, is visible in the foreground and, beyond this, part of the former Potrero Power Plant's red stack also appears along the skyline.

3.1.3.3 Potentially Affected Viewers

Within the project viewshed there are three primary types of potentially affected viewers: roadway motorists, residents, and recreational users.

Motorists, the largest viewer group, include people traveling on Third Street, a major north-south road and local transportation corridor, as well as travelers on several local roadways, including Illinois and 23rd Streets. Because of intervening buildings and vegetation, motorist views toward the project from 3rd Street are limited. While the traffic volumes on 3rd Street are relatively high, a limited number of vehicles use other public streets near the project, mostly trucks involved at work sites. Affected views are generally brief in duration, typically lasting less than a few minutes. Viewer sensitivity is considered low to moderate.

The second viewer group includes a limited number of nearby residents. As noted in Section 3.1.3.2, the immediate vicinity is primarily industrial and commercial. The closest residences are found west of Third Street, approximately 650 feet from the site; however, from this area, views of the site are obstructed by intervening street trees and buildings or structures. Residences located approximately 0.5 mile away on the eastern slope of Potrero Hill may have views of the project. From these residences, the project will appear within the context of

industrial and utility development including the existing Potrero Switchyard and the TBC facility. Residential views tend to be long in duration, and the sensitivity of this viewer group is considered moderate to high.

The third viewer group includes recreational users such as cyclists and pedestrians using Illinois Street and the Bay Trail. Views toward the site from the nearest public open space, Warm Water Cove Park, are currently blocked by buildings. The potential future expansion of Warm Water Cove Park to the end of 23rd Street could potentially increase the number of viewers in this group. Recreational views tend to be brief or moderate in duration, and the sensitivity of this viewer group is considered moderate to high.

3.1.4 Applicant-Proposed Measures and Potential Impacts

3.1.4.1 Significance Criteria

In accordance with Appendix G of the *CEQA Guidelines*, impacts to aesthetics may be considered significant if the project results in the following:

- Has a substantial adverse effect on a scenic vista
- Substantially damages scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway
- Substantially degrades the existing visual character or quality of the site and its surroundings
- Creates a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

3.1.4.2 Applicant-Proposed Measure (APM)

PG&E is proposing the following APM to further minimize less-than-significant project impacts on aesthetics/visual resources:

APM Aesthetics (AE)-1: Nighttime Lighting to Minimize Potential Visual Impacts. The new switchyard may include outdoor lighting for safety and security purposes. Design and layout for new outdoor lighting at the switchyard will incorporate measures, such as use of non-glare or hooded fixtures and directional lighting, to reduce spillover into areas outside the switchyard site and minimize the visibility of lighting from offsite locations. The new lighting will be operated only as needed and will be designed to avoid casting light or glare offsite.

3.1.4.3 Potential Impacts

As discussed in Section 2.0, the project includes installation of a new switchyard on a previously disturbed site adjacent to an existing switchyard and the TBC facility. Unlike conventional switchyards where the equipment is mostly outdoors, at this switchyard most of switchyard components will be enclosed in a pre-engineered metal building. Equipment that will be placed outdoors includes a transformer and a shunt reactor. Table 3.1-2 outlines the approximate dimensions of the major project components. The 23rd Street frontage will include an entry gate and 10-foot-tall screening wall planted with vines that will partially screen outdoor components.

TABLE 3.1-2
Approximate Dimensions of Major Potrero 230 kV Switchyard Components
PG&E Embarcadero-Potrero 230 kV Transmission Project

Component (Number of Elements)	Height (feet)	Length (feet)	Width (feet)
Equipment building (1)	40	136	62
230/115 kV Transformer (1)	28	35	23
Shunt reactor (1)	23	42	16

3.1.4.4 Lighting

The new switchyard may include outdoor lighting for safety and security purposes. The new lighting will be operated only as needed and will be designed to avoid casting light or glare offsite.

3.1.4.5 Visual Change

This section evaluates the project's potential visual effects on key public views, as represented by the visual simulations. Table 3.1-3 presents an overview of the visual simulations, including the location of each viewpoint, the project component(s) that are portrayed, and the approximate viewing distance to the nearest project element.

TABLE 3.1-3
Summary of Simulation Views
PG&E Embarcadero-Potrero 230 kV Transmission Project

Viewpoint # (See Figure 3.1-1)	Location	Visible Project Components	Approximate Distance to Nearest Project Element	PEA Figure Number
1	23rd Street east of the project	• Perimeter wall • Entrance gate • Equipment building	150 feet	3.1-3
2	Illinois Street at 23rd Street	• Perimeter wall • Entrance gate • Equipment building • Shunt reactor	400 feet	3.1-4

Figure 3.1-3A is a close-range view from 23rd Street, approximately 150 feet east of Potrero 230 kV Switchyard. Because 23rd Street dead-ends just east of this vantage point, a limited number of people experience the view from this area; however, if future public open space or shoreline access improvements occur, the number of viewers could increase. In this view, the new switchyard site lies beyond the chain link fence near the center of the view. A pole-mounted overhead light is found near the corner of the site and beyond it a metal building and portions of the existing Potrero Switchyard are visible. In the immediate foreground, an overhead awning attached to the structure located along the south side of the street frames the upper left corner of this view and on the right, a multi- story brick industrial building, adjacent to the site, screens views to the north, from this location. Street trees along Third Street, a multi-story warehouse, and trees and residences on Potrero Hill appear in the backdrop.

The visual simulation portrays the new Potrero 230 kV Switchyard, including the southern facade of the metal building that encloses most of the individual switchyard elements, and the screening wall with vines and entry gate along 23rd Street (Figure 3.1-3B). From this location, the building will partially screen views of Potrero Switchyard and the multi-story warehouse in the backdrop. The scale and appearance of the building at the new switchyard facility will be compatible with the existing visual character found in the project vicinity. In addition, the new wall with vines will screen the lower portions of the new switchyard. The wall and new landscaping will improve the streetscape appearance and enhance the pedestrian environment along 23rd Street. Given the presence of nearby existing utility and industrial facilities, the introduction of the new 230 kV Potrero Switchyard will not have a substantial effect on overall character or composition of the urban landscape in this area.

Existing View from 23rd Street east of Illinois Street looking west (VP 1)

Note: Refer to Figure 3.1-1 for viewpoint location.

Source: Environmental Vision, 2012.

FIGURE 3.1-3A
Existing View from 23rd Street east of Illinois Street
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

Visual Simulation of Proposed Project (VP 1)

Note: Refer to Figure 3.1-1 for viewpoint location.

Source: Environmental Vision, 2012.

FIGURE 3.1-3B
Visual Simulation from 23rd Street east of Illinois Street
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

Figure 3.1-4A portrays a wide-angle before and after view from 23rd Street at Illinois Street looking northeast. This vantage point provides a motorist's, cyclist's, or pedestrian's close-range, relatively unobstructed view of the existing Potrero Switchyard and the proposed new switchyard site. From this location, the project site is visible along 23rd Street, beyond the visible elements of Potrero Switchyard, including steel power structures, a metal building, and a concrete wall. The site's southern edge is demarked by chain link fence and a brick warehouse structure lies roughly at the eastern edge of the site. Silhouetted on the far right is the stack of the former Potrero Power Plant.

The Figure 3.1-4B simulation shows the new Potrero Switchyard including the new equipment building and screening wall with planting and an entry gate along 23rd Street. In addition, a small upper portion of the new shunt reactor is slightly visible beyond the switchyard wall. As seen from this intersection, the new switchyard building and the nearby existing metal building are similar in terms of scale and form and the overall appearance of the existing Potrero Switchyard and will be compatible with the existing visual character found in the project vicinity. The new screening wall with vines will improve the streetscape appearance and enhance the pedestrian environment along 23rd Street. The project-related changes described above are minor, incremental effects that will not substantially alter existing visual conditions in the area, including views toward the waterfront.

a) Will the project have a substantial adverse effect on a scenic vista? *No impact.*

For purposes of this evaluation, a scenic vista is defined as a distant public view along or through an opening or corridor that is recognized and valued for its scenic quality. Panoramic public views of the San Francisco Bay from the nearby Warm Water Cove Park represent a scenic vista. As described in Section 3.1.3.2 and demonstrated by Photograph 7, the project will not be visible from this location; therefore the project will not have an adverse effect on a scenic vista.

b) Will the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? *No impact.*

No designated state scenic routes are located near the project. Highway 280, an Eligible State Scenic Highway, lies 0.35 miles away to the west; however, intervening buildings generally screen views of the site from this roadway. Therefore, the project will not affect scenic resources within a state scenic highway corridor.

c) Will the project substantially degrade the existing visual character or quality of the site and its surroundings? *Less-than-significant impact.*

Construction

The project will not substantially degrade the existing visual character or quality of the site and its surroundings. During construction, potential visual impacts will include the presence of workers, temporary structures, construction equipment, and vehicles associated with the installation switchyard components. Construction of the new switchyard is expected to take approximately 8 months. The switchyard lies adjacent to a public street in an urban area where industrial activities typically employ trucks and other equipment not unlike construction equipment. There are no residences or other sensitive visual receptors in close proximity to the project site. Because of the presence of industrial activities, the absence of sensitive receptors, and the limited number of affected viewers, temporary construction-related visual effects will be less than significant.

Operations

The project will involve the introduction of a new switchyard on a previously disturbed vacant site adjacent to the existing Potrero Switchyard. This visual change will be minor and not particularly noticeable to the public given the primarily industrial urban landscape setting that includes the TBC facility, former power plant facility, large storage tanks, overhead utility lines, and multi-story industrial buildings.

Close-range, unobstructed views of the switchyard will occur from limited places within a block of the switchyard site; however, as described in Section 3.1.4.5 and depicted in Figures 3.1-3A through 3.1-4B, the project represents an incremental visual change to the urban landscape setting. The project will not obstruct views to the

View from 23rd Street at Illinois Street looking northeast (VP 2)

Note: Refer to Figure 3.1-1 for viewpoint location.

Source: Environmental Vision, 2012.

FIGURE 3.1-4A
Existing View from 23rd Street at Illinois Street
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

Visual Simulation of Proposed Project (VP 2)

Note: Refer to Figure 3.1-1 for viewpoint location.

Source: Environmental Vision, 2012.

FIGURE 3.1-4B
Visual Simulation from 23rd Street at Illinois Street
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

bay. Overall, the changes brought about by the project will not substantially degrade the existing visual character or quality of the landscape setting. Along its 23rd Street frontage, the switchyard will include an entry gate and a 10-foot-tall screening wall planted with vines. The new landscaped wall will screen portions of the new switchyard structures. It will also improve appearance of the streetscape and enhance the pedestrian environment along 23rd Street. With implementation of APM AE-1, less-than-significant impacts to visual resources will be further reduced.

d) Will the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? *Less-than-significant impact.*

Construction

During night-time operations, some lighting will be in place where the HDDs or other night-time work will take place. This effect will be temporary, and by directing lights away from any residential uses, will be less than significant.

Operation

Glare. The project includes a neutral color concrete perimeter screening that will be planted with vines and a new metal building that will be painted a light neutral color with a non-reflective finish. Additional switchyard structures will be a galvanized finish that will weather to a dull, non-reflective patina. The project design characteristics described above will minimize potential effect of glare.

Nighttime Lighting. The project is in an urban, primarily industrial setting with existing overhead lighting adjacent to the site as well as localized lighting sources such as street lights and commercial and industrial facilities. Within this context, new switchyard lighting will represent a minor incremental change to existing nighttime lighting conditions. The impact will be less than significant. Implementation of APM AE-1 will further reduce potential night lighting effects.

3.1.5 References

California Department of Transportation (Caltrans). 2009. *California Scenic Highway Program.*

DeLorme Mapping Company. 2003. *Northern California Atlas and Gazetteer, Sixth Edition*. Yarmoth, ME.

Federal Highway Administration (FHWA). 1988. *Visual Impact Assessment for Highway Projects*. United States Department of Transportation.

Google, Inc. 2012. Google Earth Pro Version 6.1.0. Software. Accessed June 26, 2012.

Port of San Francisco. 2001. *Waterfront Design and Access Element.* Republished version, June 2004.

Port of San Francisco. 2003. *Waterfront Land Use Plan.* Republished version, June 2004.

Port of San Francisco. 2010. *Pier 70 Preferred Master Plan*. April 2010.

San Francisco Bay Conservation and Development Commission (BCDC). 1975. *San Francisco Waterfront Special Area Plan.* As amended through February 2010.

San Francisco Planning Department. 2008. *Central Waterfront Area Plan.* December 2008.

San Francisco Planning Department. 2011. *Recreation and Open Space Element*. As amended through June 3, 2010.

San Francisco Travel. 2012. "San Francisco's 49 Mile Scenic Drive - A Brief History" Website. Online: http://www.sanfrancisco.travel/media/The-49-Mile-Scenic-Drive--A-Brief-History.html. Site accessed November 28, 2012.

Smardon, RC, J.F. Palmer, and J.P. Felleman, editors. 1986. *Foundations for Visual Project Analysis.* New York: Wiley.

3.2 Agricultural and Forest Resources

3.2.1 Introduction

This section describes existing conditions and potential impacts on agricultural and forest resources as a result of construction, operation and maintenance of the project, and concludes there will be no impacts in these areas. The proposed project's potential effects on agricultural and forest resources were evaluated as provided under the CEQA Guidelines to determine their level of significance. The significance criteria, as set forth in CEQA Guidelines Appendix G, are summarized in Table 3.2-1. The project area is within the urban City and County of San Francisco which has no agricultural lands, Williamson Act lands, mapped farmland, or forests; therefore there will be no impacts to agricultural or forest resources as a result of the project, and no Applicant-Proposed Measures are proposed.

TABLE 3.2-1
CEQA Checklist for Agricultural and Forest Resources
Embarcadero-Potrero 230 kV Transmission Project

II. AGRICULTURAL AND FOREST RESOURCES **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less-than-Significant Impact**	**No Impact**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non- agricultural use?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☑
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☑

3.2.2 Regulatory Background and Methodology

3.2.2.1 Regulatory Background

Federal or Federal Delegation

There are no federal regulations pertaining to agricultural or forest resources that are applicable to the project.

State or State Delegation

Williamson Act. The Williamson Act, or California Land Conservation Act (California Government Code Section 51200 et seq.), is a state law designed to preserve agricultural and open space land. It establishes a program of private landowner contracts that voluntarily restrict land to agricultural and open space uses. In return, Williamson Act parcels receive a lower property tax rate consistent with their actual use instead of their market

rate value. San Francisco is a non-participating county in the Williamson Act Program (California Department of Conservation, 2010). There are no Williamson Act lands in the City and County of San Francisco.

Farmland Mapping Program. The California Department of Conservation's Division of Land Resource Protection maps agriculturally viable lands and designates them as Prime, Unique, or Farmland of Statewide Importance. The City and County of San Francisco does not participate in the farmland mapping program. There is no farmland that has been designated Prime, Unique, or Farmland of Statewide Importance in the vicinity of the project.

Local

The San Francisco General Plan does not have Agricultural or Forest Elements because there are no agricultural or forest lands within the urban city. There are no local regulations pertaining to agricultural or forest resources that are applicable to the project.

3.2.2.2 Methodology

To evaluate potential effects on agricultural and forest resources, a computer search was done to locate applicable maps. No maps of agricultural lands within the project area are found in the Department of Conservation Farmland Mapping and Monitoring Program, Williamson Act Program, or San Francisco General Plan. In addition, a windshield survey was conducted of the proposed route, substation, and switchyard sites to confirm the lack of agricultural or forest land uses in the project vicinity.

3.2.3 Environmental Setting

The project would be constructed within the urban boundaries of the City and County of San Francisco, and offshore under San Francisco Bay. There are no agricultural or forest lands in the vicinity of the project.

3.2.4 Applicant-Proposed Measures and Potential Impacts

3.2.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, impacts to agricultural and forest resources may be considered significant if the Project would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production;
- Result in loss or conversion of forest land; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland or forest land to other uses.

3.2.4.2 Applicant-Proposed Measures

There are no agricultural or forest lands in the vicinity of the project. Therefore, no Applicant-Proposed Measures are recommended for agricultural resources.

3.2.4.3 Impacts

a) Would the project Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? *No Impact.*

The Farmland Mapping and Monitoring Program does not identify any farmlands within the City of San Francisco; therefore no impacts from the project would occur.

b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract? *No Impact.*

There are no lands zoned for agricultural use or under Williamson Act contract in the vicinity of the project; therefore no impact would occur.

c) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? *No Impact.*

There is no forest land in the vicinity of the project; therefore no impact would occur.

d) Would the project result in the loss of forest land or conversion of forest land to non-forest use? *No Impact.*

There is no forest land in the vicinity of the project, therefore no impact would occur.

e) Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or forest land to non-forest use? *No impact.*

As there is no farmland or forest land in the vicinity of the project, no impact would occur.

3.2.5 References

California Department of Conservation. 2010. *The California Land Conservation (Williamson) Act Status Report 2010.* Williamson Act Program. Online: http://www.conservation.ca.gov/dlrp/lca/stats_reports/Documents/2010%20Williamson%20Act%20Status%20Report.pdf. November.

California Department of Conservation. 2011. Important Farmland Data Availability Web page. Division of Land Resource Protection. Online: http://redirect.conservation.ca.gov/DLRP/fmmp/product_page.asp. Last edited March 30, 2011; accessed on May 7, 2012.

San Francisco Planning Department. 2012. San Francisco General Plan homepage. Online: http://www.sf-planning.org/ftp/General_Plan/index.htm. Accessed on May 7, 2012.

3.3 Air Quality

3.3.1 Introduction

This section discusses the regulatory background, methodology, environmental setting, and potential air quality impacts associated with project construction and operation and maintenance. Although short-term emissions from project construction will result in some temporary impacts, the project will result in a less-than-significant impact to air quality. Because infrequent maintenance or repair activities are expected to be associated with operation of the project (no substantive change in current maintenance and repair activity levels), permanent air quality impacts from operation of the project are expected to be negligible and will also be less than significant. Applicant-Proposed Measures (APMs) implemented as part of the project will further reduce these less-than-significant air quality impacts.

Appendix G of the CEQA Guidelines presents significance criteria for evaluating potential project impacts on air quality (AEP, 2011). These significance criteria, along with the results of the impact analysis for air quality impacts (see Section 3.3.4.3 below), are summarized in Table 3.3-1.

TABLE 3.3-1
CEQA Checklist for Air Quality
Embarcadero-Potrero 230 kV Transmission Project

III. AIR QUALITY **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less-than-Significant Impact**	**No Impact**
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☑	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☑	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☑
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☑

3.3.2 Regulatory Background and Methodology

The following subsections describe the regulatory background relevant to the project area as well as the methodology used to estimate emissions from both construction and operation and maintenance activities.

3.3.2.1 Regulatory Background

Federal or Federal Delegation

The federal Clean Air Act (CAA) establishes the statutory framework for regulations of air quality in the United States. Pursuant to this act, the U.S. Environmental Protection Agency (USEPA) has established various regulations to achieve and maintain acceptable air quality, including the adoption of National Ambient Air Quality Standards (NAAQS), mandatory State Implementation Plan (SIP) or maintenance plan requirements to achieve and maintain the NAAQS, and emission standards for both stationary and mobile sources of air pollution. NAAQS have been established for the following air pollutants (called "criteria" pollutants): carbon monoxide (CO), ozone, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), and lead. The

NAAQS represent levels established by USEPA to avoid specific adverse health and welfare effects associated with each pollutant with a margin of safety. Table 3.3-2 summarizes the ambient air quality standards.

USEPA has designated counties in California as either in "attainment" or "nonattainment" for each NAAQS. A region that is meeting the air quality standard for a given pollutant is designated as being in attainment for that pollutant. If the region is not meeting the air quality standard, then it is designated as being in nonattainment for that pollutant. If a region is designated as nonattainment for a NAAQS, the CAA requires the state to develop a SIP to demonstrate how the standard will be attained, including the establishment of specific requirements for review and approval of new or modified stationary sources of air pollution. Table 3.3-3 presents the federal and California attainment status for San Francisco Bay Area Air Basin (SFBAAB).

State or State Delegation

The California Air Resources Board (CARB) is the state agency responsible for California air quality management, including establishment of California Ambient Air Quality Standards (CAAQS), mobile source emission standards, and greenhouse gas (GHG) regulations; oversight of local air quality districts; and preparation of implementation plans, including regulations for stationary sources of air pollution. The CAAQS are generally more stringent, except for the 1-hour NO_2 and SO_2 standards, and include four more pollutants than the NAAQS: visibility reducing particles (VRP), sulfates, hydrogen sulfide (H_2S), and vinyl chloride (see Table 3.3-2). Similar to USEPA, CARB designates areas in California as being in attainment or nonattainment for the CAAQS. Table 3.3-3 presents the state attainment status for SFBAAB.

The California Clean Air Act, administered by CARB, requires each local air district in the state to prepare an air quality plan (part of the SIP) to achieve compliance with the CAAQS. CARB has ultimate responsibility for the SIP for nonattainment pollutants but relies on each local air district to adopt mandatory statewide programs and provide tailored additional strategies for sources under their local jurisdiction. CARB combines its data with local district data and submits the completed SIP to USEPA. The SIP consists of the emissions standards for vehicular sources and consumer products set by CARB, as well as attainment plans adopted by the air districts and approved by CARB.

CARB, in fulfillment of its primary regulatory and oversight role for mobile source emissions, has adopted a variety of vehicular emission standards and emission controls for both on-road and off-road vehicles as well as marine engines. These standards, codified in Title 13 of the California Code of Regulations (CCR), Division 3, are typically based on vehicle or engine model year and are being phased in over time.

As noted in Section 3.6.3.3, serpentinite bedrock (potentially containing naturally occurring asbestos [NOA]) is encountered locally in the project area. The Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying and Surface Mining Operations was signed into State law on July 22, 2002 (17 CCR, Section 93105; CARB 2012e) , and became effective in the Bay Area Air Quality Management District (BAAQMD) on November 19, 2002. The purpose of this regulation is to reduce public exposure to NOA from construction and mining activities that emit dust which may contain NOA. The ATCM requires regulated operations engaged in road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas where NOA is likely to be found, to employ the best available dust mitigation measures in order to reduce and control dust emissions.

Regional

The project is located within the jurisdiction of the BAAQMD. The BAAQMD is the regional agency charged with preparing, adopting, and implementing emission control measures and standards for stationary sources of air pollution pursuant to delegated state and federal authority. Because the project will not involve construction of new stationary sources, there are no permitting regulations relevant to the project. The following analysis of local plans and guidance documents is provided for informational purposes and to assist with CEQA review.

TABLE 3.3-2
Ambient Air Quality Standards
Embarcadero-Potrero 230 kV Transmission Project

Pollutant	Averaging Time	CAAQS [a]	NAAQS [b]	
			Primary [c]	Secondary [d]
Ozone	1 hour	0.09 ppm	--	--
	8 hours	0.070 ppm	0.075 ppm	0.075 ppm
Carbon monoxide (CO)	1 hour	20 ppm	35 ppm	--
	8 hours	9.0 ppm	9 ppm	--
Nitrogen dioxide (NO_2)	1 hour	0.18 ppm	0.100 ppm [e]	--
	Annual Arithmetic Mean	0.030 ppm	0.053 ppm	0.053 ppm
Sulfur dioxide (SO_2)	1 hour	0.25 ppm	0.075 ppm [f]	--
	3 hours	--	--	0.5 ppm
	24 hours	0.040 ppm	0.014 ppm	--
	Annual Arithmetic Mean	--	0.030 ppm	--
Particulate matter less than 10 microns (PM_{10})	24 hours	50 µg/m^3	150 µg/m^3	150 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3	--	--
Particulate matter less than 2.5 microns ($PM_{2.5}$)	24 hours	--	35 µg/m^3	35 µg/m^3
	Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3	15 µg/m^3
Lead [g]	30-day Average	1.5 µg/m^3	--	--
	Calendar Quarter	--	1.5 µg/m^3	1.5 µg/m^3
	Rolling 3-month Average	--	0.15 µg/m^3	0.15 µg/m^3
Visibility reducing particles (VRP) [g]	8 hours	[h]	--	--
Sulfates	24 hours	25 µg/m^3	--	--
Hydrogen sulfide (H_2S)	1 hour	0.03 ppm	--	--
Vinyl chloride	24 hours	0.01 ppm	--	--

Notes:
ppm = parts per million
µg/m^3 = micrograms per cubic meter
-- = No standard has been adopted for this averaging time
[a] California Ambient Air Quality Standards for ozone, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM_{10}, $PM_{2.5}$, and VRP), are values that are not to be exceeded. All others are not to be equaled or exceeded.
[b] National Ambient Air Quality Standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
[c] Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
[d] Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
[e] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 0.100 ppm.
[f] To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 0.075 ppm.
[g] CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
[h] Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.
Source: CARB, 2012b

TABLE 3.3-3
Federal and California Air Quality Attainment Status for San Francisco Bay Area Air Basin
Embarcadero-Potrero 230 kV Transmission Project

Pollutant	Averaging Time	Federal Status	California Status
Ozone	1 hour	--	Serious Nonattainment
	8 hours	Marginal Nonattainment	Nonattainment
Carbon monoxide (CO)	1 hour	Maintenance	Attainment
	8 hours	Maintenance	Attainment
Nitrogen dioxide (NO_2)	1 hour	Attainment	Attainment
	Annual Arithmetic Mean	Attainment	Attainment
Sulfur dioxide (SO_2)	1 hour	Attainment	Attainment
	3 hours	Attainment	--
	24 hours	Attainment	Attainment
	Annual Arithmetic Mean	Attainment	--
Particulate matter less than 10 microns (PM_{10})	24 hours	Attainment	Nonattainment
	Annual Arithmetic Mean	--	Nonattainment
Particulate matter less than 2.5 microns ($PM_{2.5}$)	24 hours	Nonattainment	Nonattainment
	Annual Arithmetic Mean	Nonattainment	Nonattainment

Notes:
-- = No standard has been adopted for this averaging time
Sources: USEPA, 2012b; CARB, 2012c; BAAQMD, 2012a

Under the California Clean Air Act, the BAAQMD is required to develop an air quality plan to achieve and/or maintain compliance with federal and state nonattainment criteria pollutants within the air district. The BAAQMD has taken action and developed plans to achieve and/or maintain compliance with the federal 1-hour ozone standard and the federal CO standard. Additionally, recent monitoring data indicate that $PM_{2.5}$ levels have decreased in the Bay Area since 2008. As a result, CARB submitted a "clean data finding" request to USEPA on behalf of the BAAQMD on December 8, 2011. If approved, the BAAQMD can meet the federal $PM_{2.5}$ standard by preparing a redesignation request and a $PM_{2.5}$ maintenance plan or a "clean data" SIP submittal (BAAQMD, 2012b).

The BAAQMD adopted the *BAAQMD CEQA Guidelines* in December 1999 to assist local jurisdictions and lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality (BAAQMD, 1999). The BAAQMD CEQA Guidelines were updated in June 2010 and again in May 2011 to include reference to thresholds of significance adopted by the BAAQMD. On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds of significance. As a result, the BAAQMD has been ordered by the Court to set aside the June 2010/May 2011 thresholds of significance and is no longer disseminating them or recommending that they be used as a generally applicable measure of a project's significant air quality impacts. Instead, lead agencies may continue to rely upon the BAAQMD's 1999 thresholds of significance and may continue to make determinations on significance based on substantial evidence in the record. Lead agencies may also rely on the BAAQMD's current CEQA Air Quality Guidelines (updated in May 2012) for assistance in calculating air pollution emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures (BAAQMD, 2012c).

Lastly, the BAAQMD adopted the *Bay Area 2010 Clean Air Plan* (CAP) on September 15, 2010. The Bay Area 2010 CAP provides an integrated, multi-pollutant control strategy to reduce emissions and decrease ambient

concentrations of harmful pollutants; safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily impacted by air pollution; and reduce GHG emissions to protect the climate (BAAQMD, 2010).

3.3.2.2 Methodology

Short-term construction emissions of CO, SO_2, PM_{10}, and $PM_{2.5}$ were evaluated. Because ozone is formed through chemical reactions in the atmosphere, the ozone precursors oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) were also calculated. Detailed construction emissions calculations including assumptions are presented in Appendix A and summarized in Table 3.3-7 in Section 3.3.4.3, Potential Impacts.

Construction emissions were estimated using construction equipment emission factors from the *California Emissions Estimator Model (CalEEMod) User's Guide* (Environ, 2011), vehicle emissions factors from EMFAC2007 (version 2.3), and marine vessel emission factors from the USEPA's (1996) compilation of air pollutant emission factors known as *AP-42* and Title 17, Section 93118.5 of the California Code of Regulations (CARB, 2010). PM_{10} and $PM_{2.5}$ emissions from vehicle travel on paved roads were estimated using emission factors from *AP-42* (USEPA, 2011). PM_{10} emissions from soil disturbance were quantified using the grading and cut / fill emission factors in the *Software User's Guide: URBEMIS2007 for Windows* (JSA, 2007). $PM_{2.5}$ emissions from soil disturbance and diesel-fueled ships were assumed to be 20.8 percent and 92 percent of the PM_{10} emissions, respectively, per the *Final – Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds* (SCAQMD, 2006).

Operational emissions associated with inspections and ongoing maintenance activities (primarily associated with periodic maintenance vehicle travel) were not estimated as these activities are part of PG&E's ongoing, baseline operations and are expected to be infrequent and minimal. Potential operational GHG emissions from circuit breaker leakage are addressed in Section 3.7, Greenhouse Gas Emissions.

3.3.3 Environmental Setting

3.3.3.1 Regional

The project is located in San Francisco County within the SFBAAB. The SFBAAB is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. The Coast Range splits, resulting in a western coast gap, the Golden Gate, and an eastern coast gap, the Carquinez Strait, both of which allow air to flow in and out of the SFBAAB and the Central Valley (BAAQMD, 2011).

The climate in the SFBAAB is dominated by the strength and location of a semi-permanent, subtropical high-pressure cell. During the summer, the Pacific high-pressure cell is centered over the northeastern Pacific Ocean resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwelling of cold ocean water from below to the surface because of the northwesterly flow produces a band of cold water off the California coast. The cool and moisture-laden air approaching the coast from the Pacific Ocean is further cooled by the presence of the cold water band resulting in condensation and the presence of fog and stratus clouds along the Northern California coast. In the winter, the Pacific high-pressure cell weakens and shifts southward resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Weak inversions coupled with moderate winds result in a low air pollution potential (BAAQMD, 2011).

The SFBAAB is characterized by moderately wet winters and dry summers. Winter rains account for about 75 percent of the average annual rainfall. The amount of annual precipitation can vary greatly from one part of the SFBAAB to another even within short distances. In general, total annual rainfall can reach 40 inches in the mountains, but it is often less than 16 inches in sheltered valleys (BAAQMD, 2011).

The climatological subregion in which the project is located extends from northwest of San Jose to the Golden Gate. The Santa Cruz Mountains run up the center of the peninsula, with elevations exceeding 2,000 feet at the southern end, decreasing to 500 feet in South San Francisco. Coastal towns experience a high incidence of cool, foggy weather in the summer whereas cities in the southeastern peninsula experience warmer temperatures and fewer foggy days because the marine layer is blocked by the ridgeline to the west. San Francisco lies at the

northern end of the peninsula. Because most of San Francisco's topography is below 200 feet, marine air is able to flow easily across most of the city, making its climate cool and windy (BAAQMD, 2011).

The blocking effect of the Santa Cruz Mountains results in variations in summertime maximum temperatures in different parts of the peninsula. The mean maximum summer temperatures in coastal areas and San Francisco are in the mid-60s degrees Fahrenheit (°F) whereas the mean maximum summer temperatures in Redwood City are in the low 80s°F. Mean minimum temperatures during the winter months are in the high 30s to low 40s°F on the eastern side of the Peninsula and in the low 40s°F on the coast (BAAQMD, 2011).

Annual average wind speeds range from 5 to 10 miles per hour throughout the peninsula, with higher wind speeds usually found along the coast. The peninsula's prevailing winds are from the west, although wind patterns are often influenced greatly by local topographic features (BAAQMD, 2011).

The air pollution potential is highest along the southeastern portion of the peninsula, which is most protected from the high winds and fog of the marine layer. Air pollutant emissions are relatively high in this region due to motor vehicle traffic as well as stationary sources. Pollutant emissions are high at the northern end of the peninsula in San Francisco, especially from motor vehicle congestion. Winds in this region, however, are generally fast enough to carry the pollutants away before they can accumulate (BAAQMD, 2011).

3.3.3.2 Local

The primary pollutants of concern in SFBAAB are ozone, PM_{10}, and $PM_{2.5}$ because SFBAAB is designated nonattainment for these pollutants by USEPA and/or CARB. Ozone is not directly emitted but is formed in the atmosphere by complex chemical reactions of various precursors (VOCs and NO_x) in the presence of sunlight. The major sources of ozone precursor emissions are combustion processes (including motor vehicle engines); the evaporation of solvents, paints, and fuels; and biogenic sources. Most particulate matter (PM_{10} and $PM_{2.5}$) is caused by combustion, factories, construction, grading, demolition, agricultural activities, and motor vehicles (BAAQMD, 2011).

CARB maintains an annual emission inventory for each county and air basin in the state. The most recent published inventory data for the SFBAAB is summarized in Table 3.3-4. In the SFBAAB, mobile source emissions account for over 30 percent, 80 percent, and 80 percent of the air basin's VOC, CO, and NO_x emissions, respectively. Area sources account for over 80 percent and 60 percent of the air basin's PM_{10} and $PM_{2.5}$ emissions, respectively. Stationary sources account for over 70 percent of the air basin's sulfur oxide (SO_X) emissions.

The BAAQMD operates a network of ambient air quality monitoring stations that measure concentrations of ozone, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$. To determine the existing ambient air quality for the project, the nearest monitoring stations were identified. The nearest monitoring stations are located at 10 Arkansas Street in San Francisco, California and 1100 21st Street in Oakland, California. Table 3.3-5 presents concentrations of the criteria pollutants measured at these two monitoring stations between 2009 and 2011. Measured $PM_{2.5}$ concentrations in San Francisco have exceeded the federal 24-hour standard but not the federal or state annual standards in the past three years. Measured ozone, CO, NO_2, SO_2, and PM_{10} concentrations at these monitoring stations have not exceeded the federal or state standards in the past three years (CARB, 2012d; USEPA, 2012a).

As previously noted, serpentinite bedrock is encountered in the local area. The BAAQMD does not monitor ambient air for NOA, but does implement the State-mandated Asbestos ATCM for Construction, Grading, Quarrying and Surface Mining Operations. The ATCM requires regulated operations engaged in road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas where NOA is likely to be found, to employ the best available dust mitigation measures in order to reduce and control dust emissions.

TABLE 3.3-4
Estimated Annual Average Emissions for the San Francisco Bay Area Air Basin
Embarcadero-Potrero 230 kV Transmission Project

Source Category	Emissions (tons/day)					
	VOCs	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Stationary Sources						
Fuel Combustion	3.2	41.0	45.9	12.4	5.5	5.5
Waste Disposal	35.9	1.9	0.6	0.2	0.1	0.1
Cleaning and Surface Coatings	35.7	0.0	0.0	--	0.0	--
Petroleum Production and Marketing	21.0	0.3	0.6	26.4	1.0	0.9
Industrial Processes	11.3	2.0	4.2	8.2	10.0	5.9
Total Stationary Sources	107.1	45.2	51.3	47.1	16.6	12.4
Stationary Sources Percentage of Total	23.0	2.7	12.3	75.1	7.5	14.4
Areawide Sources						
Solvent Evaporation	72.5	--	--	--	--	--
Miscellaneous Processes	16.6	163.2	17.2	0.6	179.3	53.6
Total Areawide Sources	89.1	163.2	17.2	0.6	179.3	53.6
Areawide Sources Percentage of Total	19.1	9.9	4.1	1.0	81.2	62.4
Mobile Sources						
On-road Motor Vehicles	97.4	913.6	180.6	0.9	10.0	6.9
Other Mobile Sources	65.7	473.8	165.1	13.5	9.8	8.7
Total Mobile Sources	163.1	1,387.4	345.6	14.4	19.8	15.7
Mobile Sources Percentage of Total	35.0	84.3	83.1	23.0	9.0	18.3
Natural Sources						
Natural (Non-anthropogenic) Sources	106.5	49.4	1.6	0.5	5.1	4.3
Total Natural Sources	106.5	49.4	1.6	0.5	5.1	4.3
Natural Sources Percentage of Total	22.9	3.0	0.4	0.8	2.3	5.0
Grand Total	**465.7**	**1,645.1**	**415.8**	**62.7**	**220.8**	**85.9**

Notes:
-- = Emissions negligible
CO = carbon monoxide; NO_x = oxides of nitrogen; PM_{10} = particulate matter with an aerodynamic diameter less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than 2.5 microns; SO_x = sulfur oxide; VOCs = volatile organic compounds
Source: CARB, 2012a

TABLE 3.3-5
Summary of Maximum Ambient Air Monitoring Data Near the Project
Embarcadero-Potrero 230 kV Transmission Project

Pollutant	Averaging Time	Units	2009	2010	2011
Ozone [a]	1 hour	ppm	0.072	0.079	0.070
	8 hours		0.057	0.051	0.054
Carbon monoxide (CO)	1 hour [b]	ppm	4.3	1.8	1.8
	8 hours [a]		2.86	1.37	1.20
Nitrogen dioxide (NO_2) [a]	1 hour	ppm	0.059	0.093	0.093
	Annual Arithmetic Mean		0.015	0.013	0.014
Sulfur dioxide (SO_2)	1 hour [b]	ppm	0.024	0.011	0.019
	3 hours		NM	NM	NM
	24 hours [c]		0.005	0.004	0.003
	Annual Arithmetic Mean [c]		*	0.000	0.001
Particulate matter less than 10 microns (PM_{10}) [a]	24 hours	$\mu g/m^3$	36.0	39.7	45.6
	Annual Arithmetic Mean		18.6	19.3	19.5
Particulate matter less than 2.5 microns ($PM_{2.5}$) [a]	24 hours	$\mu g/m^3$	49.8	56.3	47.5
	Annual Arithmetic Mean		*	10.5	9.5

Notes:
$\mu g/m^3$ = micrograms per cubic meter; ppm = parts per million
NM = Pollutant averaging time not monitored
* = Insufficient data available to determine the value
[a] Data, documented by CARB, from the monitoring station located at 10 Arkansas Street, San Francisco, California.
[b] Data documented by USEPA, from the monitoring station located at 10 Arkansas Street, San Francisco, California.
[c] Data documented by CARB, from the monitoring station located at 1100 21st Street, Oakland, California.
Sources: CARB, 2012d; USEPA, 2012a

3.3.4 Applicant-Proposed Measures and Potential Impacts

3.3.4.1 Significance Criteria

In accordance with Appendix G of the *CEQA Guidelines*, impacts to air quality may be considered significant if the project:

- Conflicts with or obstructs implementation of any applicable air quality plan,
- Violates any air quality standard or contributes substantially to an existing or projected air quality violation,
- Results in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors),
- Exposes sensitive receptors to a substantial pollutant concentration, and/or
- Creates objectionable odors affecting a substantial number of people.

As discussed in Section 3.3.2.1, the currently-applicable BAAQMD thresholds of significance were established in the District's 1999 CEQA Guidelines.

With respect to construction emissions, the 1999 thresholds of significance indicate that "if all the control measures indicated in Table 2 [of the BAAQMD CEQA Guidelines] (as appropriate, depending on the size of the project area) will be implemented, then air pollutant emissions from construction activities would be considered a less than significant impact" (BAAQMD, 1999). Applicable measures from Table 2 of the 1999 BAAQMD CEQA Guidelines have been included in the project as APMs.

The BAAQMD CEQA Guidelines do provide quantitative thresholds of significance for evaluating a project's operational emissions, as shown in Table 3.3-6. A project that generates criteria air pollutant emissions in excess

of the annual or daily thresholds of significance would be considered to have a significant air quality impact (BAAQMD, 1999).

TABLE 3.3-6
BAAQMD CEQA Air Quality Thresholds of Significance for Operation-Related Emissions
Embarcadero-Potrero 230 kV Transmission Project

Pollutant	Daily (lbs/day)	Annual (tons/year)
Volatile organic compounds (VOCs)	80	15
Oxides of nitrogen (NO_x)	80	15
Particulate matter less than 10 microns (PM_{10})	80	15

Notes:
lbs/day = pounds per day
Source: BAAQMD, 1999

3.3.4.2 Applicant-Proposed Measures

PG&E is proposing the following three air quality-related APMs:

APM Air Quality (AQ)-1: Minimize Fugitive Dust. Consistent with Table 2 of the BAAQMD CEQA Guidelines, PG&E will minimize dust emissions during construction by implementing the following measures:

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Post a publicly visible sign with the telephone number and person to contact regarding dust complaints. This person will respond and take corrective action within 48 hours. The BAAQMD's phone number will also be visible to ensure compliance with applicable regulations.

Since these measures are consistent with the BAAQMD CEQA Guidelines, construction emissions are considered to be less than significant (BAAQMD, 1999; BAAQMD, 2012c). Note that implementation of the first measure listed above would not apply to paved areas with no exposed soil or when rains are occurring.

APM AQ-2: Minimize Construction Exhaust Emissions. The following measures will be implemented during construction to further minimize the less-than-significant construction exhaust emissions:

- Encourage construction workers to take public transportation to the project site where feasible.
- Minimize construction equipment exhaust by using low-emissions or electric construction equipment where feasible. Develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used would achieve a project-wide fleet-average 20 percent NO_x reduction and 45 percent PM reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.
- Minimize unnecessary construction vehicle idling time. The ability to limit construction vehicle idling time is dependent upon the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times following start-up that

limit their availability for use following start-up. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The project will apply a "common sense" approach to vehicle use, such that idling is reduced as far as possible below the maximum of five consecutive minutes required by regulation (13 CCR 2485). If a vehicle is not required for use immediately or continuously for construction activities or other safety-related reasons, its engine will be shut off.

- Minimize welding and cutting by using compression or mechanical applications where practical and within standards.
- Encourage use of natural gas or electric powered vehicles for passenger cars and light-duty trucks where feasible and available.

APM AQ-3: Minimize Potential Naturally Occurring Asbestos (NOA) Emissions. The following measures will be implemented prior to and during construction to minimize the potential for NOA emissions:

- Prior to commencement of construction, samples of the Potrero Switchyard construction area will be analyzed for presence of asbestos, serpentinite or ultramafic rock
- If asbestos, serpentinite or ultramafic rock is determined to be present, implement all applicable provisions of the ATCM for Construction, Grading, Quarrying and Surface Mining Operations (17 CCR 93105), including:

  For disturbed areas of 1.0 acre or less

  - Construction vehicle speed at the work site will be limited to 15 miles per hour or less
  - Prior to any ground disturbance, sufficient water will be applied to the area to be disturbed to prevent visible emissions from crossing the property line
  - Areas to be graded or excavated will be kept adequately wetted to prevent visible emissions from crossing the property line
  - Storage piles will be kept adequately wetted, treated with a chemical dust suppressant, or covered when material is not being added to or removed from the pile
  - Equipment will be washed down before moving from the property onto a paved public road
  - Visible track-out on the paved public road will be cleaned using wet sweeping or a High Efficiency Particular Air filter equipped vacuum device within 24 hours

  For disturbed areas of greater than 1.0 acre

  - Submit an Asbestos Dust Mitigation Plan to the BAAQMD and obtain approval prior to commencement of construction
  - Implement and maintain the provisions of the approved Asbestos Dust Mitigation Plan from the beginning of construction through the duration of the construction activity

3.3.4.3 Potential Impacts

Detailed emissions calculations including assumptions were calculated as described above in Section 3.3.2.2, Methodology, and are presented in Appendix A and summarized in Table 3.3-7 below.

TABLE 3.3-7
Construction Emissions Summary
Embarcadero-Potrero 230 kV Transmission Project

Construction Phase	Maximum Daily Emissions (lbs/day) [a]					
	VOC	**CO**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Project Emissions						
Construction Year 2014 [b]	27.62	68.16	110.75	0.85	74.91	18.55
Construction Year 2015 [c]	272.28	949.37	1,328.37	99.22	73.80	49.89
Maximum Daily Emissions	**272.28**	**949.37**	**1,328.37**	**99.22**	**74.91**	**49.89**
Maximum Daily Emissions [d]	**0.14 tons/day**	**0.47 tons/day**	**0.66 tons/day**	**0.05 tons/day**	**0.04 tons/day**	**0.02 tons/day**
Emissions by Phase						
Submarine Route Cable Installation						
Land Installation						
Mobilization	1.26	6.61	11.52	0.02	0.96	0.54
Manholes	5.56	22.53	43.52	0.06	37.16	9.66
Trenching	3.71	17.18	28.27	0.04	36.36	8.92
Cable Installation	1.23	5.53	11.42	0.02	0.77	0.49
HDD Drilling						
HDD Send Pit Excavation	1.50	7.33	8.89	0.01	37.02	8.31
HDD Bore	20.41	20.78	26.18	0.77	1.95	1.68
Casing Fuse	1.22	7.36	8.63	0.01	0.91	0.71
Pull In Casing	22.78	46.93	79.01	0.80	4.72	4.21
Restoration	1.22	7.36	8.46	0.01	0.91	0.71
Off-Shore Installation						
Mobilization	56.76	28.90	41.86	2.24	3.18	2.63
Marine Survey	56.76	28.90	41.86	2.24	3.18	2.63
Route Clearing	56.76	28.90	41.86	2.24	3.18	2.63
Cable Delivery / Loading	4.86	18.15	50.34	0.07	1.92	1.84
Cable Laying	272.28	949.37	1,328.37	99.22	54.62	49.89
Cable Splicing	3.22	15.73	25.58	0.04	1.92	1.57
Submarine Route Cable Installation Daily Maximum	**272.28**	**949.37**	**1,328.37**	**99.22**	**74.18**	**49.89**
Switchyard Construction						
General Construction	0.03	1.05	0.17	0.00	0.19	0.05
Structure Foundation Excavation	1.11	4.50	6.74	0.01	1.10	0.68
Structure Delivery and Setup	1.62	5.95	12.01	0.02	0.54	0.53
Cable Installation	0.43	3.01	3.29	0.01	0.23	0.19
Cleaning and Landscaping	0.60	3.38	4.41	0.01	0.86	0.43
Switchyard Construction Daily Maximum	**1.64**	**7.01**	**12.18**	**0.02**	**1.28**	**0.73**

TABLE 3.3-7
Construction Emissions Summary
Embarcadero-Potrero 230 kV Transmission Project

Construction Phase	Maximum Daily Emissions (lbs/day) [a]					
	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Emissions by Month						
March 2014	1.13	5.56	6.91	0.01	1.28	0.73
April 2014	1.13	5.56	6.91	0.01	1.28	0.73
May 2014	1.13	5.56	6.91	0.01	1.28	0.73
June 2014	1.64	7.01	12.18	0.02	1.28	0.73
July 2014	1.64	7.01	12.18	0.02	0.73	0.58
August 2014	1.64	7.01	12.18	0.02	0.73	0.58
September 2014	7.20	29.53	55.70	0.08	37.89	10.24
October 2014	27.62	50.31	81.87	0.84	74.91	18.55
November 2014	24.58	42.02	57.91	0.81	38.72	10.85
December 2014	26.95	68.16	110.75	0.85	41.49	13.38
January 2015	26.95	68.16	110.75	0.85	41.49	13.38
February 2015	24.58	42.02	57.91	0.81	73.80	17.48
March 2015	22.11	30.37	41.06	0.79	3.14	2.42
April 2015	24.48	56.52	93.89	0.83	5.90	4.95
May 2015	23.24	50.99	82.47	0.81	5.13	4.46
June 2015	57.39	33.33	46.44	2.25	4.22	3.12
July 2015	57.36	32.28	46.27	2.25	4.04	3.07
August 2015	57.36	32.28	46.27	2.25	4.04	3.07
September 2015	57.36	32.28	46.27	2.25	4.04	3.07
October 2015	272.28	949.37	1,328.37	99.22	54.62	49.89
November 2015	3.22	15.73	25.58	0.04	1.92	1.57
December 2015 [e]	--	--	--	--	--	--

Notes:
CO = carbon monoxide; NO_x = oxides of nitrogen; PM_{10} = particulate matter with an aerodynamic diameter less than 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than 2.5 microns; SO_x = sulfur oxide; VOCs = volatile organic compounds.
[a] These are daily maximum emissions that only occur during very limited periods of the overall construction schedule.
[b] Construction activities occurring in 2014 include Land Installation (Mobilization, Manholes, and Trenching) and HDD Drilling (HDD Send Pit Excavation, HDD Bore, Casing Fuse, and Pull In Casing) associated with the Submarine Route Cable Installation as well as Switchyard Construction (General Construction, Structure Foundation Excavation, Structure Delivery and Setup, and Cable Installation).
[c] Construction activities occurring in 2015 include Land Installation (Trenching and Cable Installation), HDD Drilling (HDD Send Pit Excavation, HDD Bore, Casing Fuse, Pull In Casing, and Restoration), and Off-Shore Installation associated with the Submarine Route Cable Installation as well as Switchyard Construction (General Construction, Cable Installation, and Cleaning and Landscaping).
[d] Maximum daily emissions are provided in units of tons/day to allow comparison against the regional emissions inventory for the San Francisco Bay Area Air Basin, shown in Table 3.3-5.
[e] As noted in Table 3, Construction Schedule, in Appendix A, Air Quality and GHG Calculations, no significant construction activity is expected during Testing and Commissioning, which is the only activity scheduled for December 2015.

a) Would the project conflict with or obstruct implementation of the applicable air quality plan? *No impact.*

Construction and Operation

As discussed in Section 3.3.2.1, the BAAQMD has developed plans to achieve and/or maintain compliance with the federal 1-hour ozone standard. The most recent of these plans prepared in response to federal planning requirements is the *San Francisco Bay Area 2001 Ozone Attainment Plan for the 1-hour National Ozone Standard* (2001 Ozone Attainment Plan), which contains a control strategy with seven new stationary source measures, twelve new mobile source measures, five new transportation control measures, and eleven further-study measures (BAAQMD, 2001). The most recent State ozone plan is the Bay Area 2010 CAP, adopted by the Board of Directors in September 2010. Additionally, the Bay Area 2010 CAP provides an integrated, multi-pollutant control strategy to reduce emissions of ozone, particulates, air toxics, and GHGs (BAAQMD, 2010).

Because the project would not include any new stationary sources, the stationary control measures identified in the 2001 Ozone Attainment Plan are not applicable. However, the mobile source control measures pertaining to heavy-duty off-road equipment are applicable. The project would be consistent with the 2001 Ozone Attainment Plan because APM AQ-2 contains measures targeting off-road equipment, including the use of equipment meeting CARB-approved engine standards.

Similarly, the project would be consistent with the Bay Area 2010 CAP in that APM AQ-2 encourages the use of low-emission or electric construction equipment where feasible. APM AQ-2 also encourages the use of public transportation to reduce traffic in the project vicinity, which is consistent with the transportation control measures identified in the Bay Area 2010 CAP. Therefore, the project will not conflict with or obstruct implementation of the applicable air quality plan.

b) Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation? *Less-than-significant impact.*

Construction

The project's estimated construction emissions, summarized in Table 3.3-7, will be temporary and will only occur during limited portions of the 22-month construction period. Maximum daily emissions are expected to occur during a single month of construction and daily construction emissions are expected to be substantially less during other periods, as summarized in Table 3.3-7. Additionally, these maximum daily emissions are miniscule when compared with overall regional emissions shown in Table 3.3-4. PG&E is including APM AQ-1 to reduce construction-related emissions, and the BAAQMD CEQA Guidelines indicate that construction emissions are considered less than significant with the inclusion of these measures (BAAQMD, 1999). Construction emissions will be further reduced with implementation of APM AQ-2. Therefore, construction emissions are expected to have a less-than-significant impact on air quality and are not expected to violate any air quality standard.

Operation

Operation and maintenance of the project will be incorporated into existing PG&E activities such that emissions from project-related operation and maintenance activities will be negligible and not anticipated to be higher than the thresholds of significance shown in Table 3.3-6. Therefore operation and maintenance emissions will have a less-than-significant impact on air quality, and will not violate any air quality standard.

c) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)? *Less-than-significant impact.*

Construction

The project is located in an area that is designated nonattainment for the state and federal ozone and $PM_{2.5}$ ambient air quality standards and state PM_{10} ambient air quality standards. Project construction will not result in a cumulatively significant increase in the nonattainment pollutants (PM_{10}, $PM_{2.5}$, and the ozone precursors [NO_x and VOC]) because the emissions will be temporary and the maximum daily emissions would occur for only a very small portion of the overall construction period. Additionally, the construction emissions are miniscule when compared with overall regional emissions shown in Table 3.3-4. Emissions will be further reduced with the implementation of APMs AQ-1 and AQ-2. Therefore, construction emissions are expected to have a less-than-

significant impact on air quality and are not expected to result in a cumulatively considerable net increase of nonattainment pollutants.

Operation

As discussed above, operational emissions are expected to be negligible and have a less-than-significant impact on air quality because operation and maintenance of the project will be incorporated into existing, ongoing PG&E activities. Therefore, operational emissions are not expected to result in a cumulatively considerable net increase of nonattainment pollutants.

d) Would the project expose sensitive receptors to substantial pollutant concentrations? *No impact.*

Construction

Sensitive receptors are defined as facilities or land uses that include people who are particularly susceptible to the effects of air pollution (e.g., children, the elderly, and people with illnesses). Schools, hospitals, and residential areas are all examples of sensitive receptors (BAAQMD, 1999). There are no schools or hospitals located within half a mile of Potrero Switchyard; one school is present less than 0.25 miles from the underground portions of the project at Embarcadero.

The majority of construction activities will occur in the San Francisco Bay, removed from sensitive receptors, or in highly industrialized areas. However, the northern end of the project, starting at Embarcadero Substation, is in a primarily residential and commercial area, thus increasing the potential for pollutant exposure. Because the project's construction emissions are short-term and miniscule relative to the overall regional emissions shown in Table 3.3-4, no significant impacts are expected to occur for the nearby sensitive receptors during construction.

Operation

Because the project would not include any new stationary sources, no significant impacts are expected to occur for the nearby sensitive receptors during operation.

e) Would the project create objectionable odors affecting a substantial number of people? *No impact.*

Project construction will involve the temporary use of vehicles and construction equipment that do not generate significant odors. The project does not include any facilities expected to create objectionable odors such as wastewater treatment plants, landfills, composting facilities, refineries, or chemical plants (BAAQMD, 1999). Therefore, there will be no impact from odorous emissions affecting a substantial number of people.

3.3.5 References

Association of Environmental Professionals (AEP). 2011. *2011 California Environmental Quality Act (CEQA) Statute and Guidelines.* January.

Bay Area Air Quality Management District (BAAQMD). 1999. *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans.* December. Online: http://www.baaqmd.gov/Divisions/Planning-and-Research/Planning-Programs-and-Initiatives/~/media/8C1411130E9947DC939B618A43732FCF.ashx.

Bay Area Air Quality Management District (BAAQMD). 2001. *San Francisco Bay Area 2001 Ozone Attainment Plan for the 1-hour National Ozone Standard*. Revision to the State Implementation Plan (SIP). October.

Bay Area Air Quality Management District (BAAQMD). 2010. *Bay Area 2010 Clean Air Plan*. September.

Bay Area Air Quality Management District (BAAQMD). 2011. *California Environmental Quality Act (CEQA) Air Quality Guidelines.* May.

Bay Area Air Quality Management District (BAAQMD). 2012a. "Air Quality Standards and Attainment Status" Web page. Online: http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm. Accessed May 15, 2012.

Bay Area Air Quality Management District (BAAQMD). 2012b. "PM Planning" Web page. Online: http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/PM-Planning.aspx. Accessed May 15, 2012.

Bay Area Air Quality Management District (BAAQMD). 2012c. *California Environmental Quality Act Air Quality Guidelines*. Updated May 2012. Online: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx.

California Air Resources Board (CARB). 2010. *Title 17, California Code of Regulations, Section 93118.5, Airborne Toxic Control Measure for Commercial Harbor Craft.* June.

California Air Resources Board (CARB). 2012a. "2009 Almanac Emission Projection Data" Web page. Online: http://www.arb.ca.gov/app/emsinv/emssumcat.php. Accessed June 26, 2012.

California Air Resources Board (CARB). 2012b. "Ambient Air Quality Standards" data table. Online: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed May 15, 2012.

California Air Resources Board (CARB). 2012c. "Area Designations Maps / State and National" Web page. Online: http://www.arb.ca.gov/desig/adm/adm.htm. Accessed May 15, 2012.

California Air Resources Board (CARB). 2012d. "Top 4 Summary: Select Pollutant, Years, & Area" Web page. Online: http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed May 16, 2012.

California Air Resources Board (CARB). 2012e. "2002-07-29 Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations" Web page. Online: http://www.arb.ca.gov/toxics/atcm/asb2atcm.htm. Accessed August 3, 2012.

Environ International Corporation (Environ). 2011. *California Emissions Estimator Model (CalEEMod) User's Guide*. February.

Jones & Stokes Associates (JSA). 2007. *Software User's Guide: URBEMIS2007 for Windows*. November.

South Coast Air Quality Management District (SCAQMD). 2006. *Final – Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds.* October.

United States Environmental Protection Agency (USEPA). 1996. *AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors.* Chapter 3.3-4, Control Technologies. November.

United States Environmental Protection Agency (USEPA). 2011. *AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors.* Chapter 13.2.1, Paved Roads. January.

United States Environmental Protection Agency (USEPA). 2012a. "AirData / Monitor Values Report" Web page. Online: http://www.epa.gov/airdata/ad_rep_mon.html. Accessed May 16, 2012.

United States Environmental Protection Agency (USEPA). 2012b. "The Green Book Nonattainment Areas for Criteria Pollutants" Web page. Online: http://www.epa.gov/air/oaqps/greenbk/index.html. Accessed May 15, 2012.

3.4 Biological Resources

3.4.1 Introduction

This section describes biological resources in the project area and identifies potential impacts on habitats and species that could result from the implementation of the project.

The proposed project's potential effects on biological resources were evaluated to determine their level of significance as provided under the CEQA Guidelines. The significance criteria for biological resources, as set forth in CEQA Guidelines Appendix G, are summarized in Table 3.4-1. The project will have no or less-than-significant impacts on terrestrial resources, as described below, and less-than-significant impacts on aquatic resources with incorporation of the applicant-proposed measures (APMs) described in Section 3.4.4.2.

TABLE 3.4-1
CEQA Checklist for Biological Resources
Embarcadero-Potrero 230 kV Transmission Project

IV. BIOLOGICAL RESOURCES **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporation**	**Less than Significant Impact**	**No Impact**
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☑	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

3.4.2 Regulatory Background and Methodology

3.4.2.1 Regulatory Background

This section summarizes existing federal, state, and local laws, policies, and regulations that pertain to biological resources.

Federal or Federal Delegated

Federal Endangered Species Act (16 U.S.C. § 1538). The federal Endangered Species Act (ESA) is implemented by U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS, also known as NOAA Fisheries). The ESA protects plants and wildlife that are listed as endangered or threatened by USFWS and NMFS. Section 9 of the ESA prohibits the take of listed fish and wildlife, where "take" is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 CFR 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging-up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 United States Code [U.S.C.] 1538).

Under Section 7 of the ESA, federal agencies are required to consult with USFWS and/or NMFS if their actions, including permit approvals or funding, could adversely affect an endangered species (including plants) or its critical habitat. The USFWS or NMFS determines whether a proposed agency action(s) is likely to jeopardize the continued existence of a listed species (jeopardy opinion) or destroy or adversely modify critical habitat (adverse modification). Through consultation and the issuance of a Biological Opinion, the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity, provided the action will not jeopardize the continued existence of the species.

Section 10(a)(1)(b) of the ESA allows for issuance of incidental take permits to private parties when there is no federal nexus, provided a Habitat Conservation Plan (HCP) is developed. The private party initiates consultation with USFWS or NMFS to discuss target species in the project area. The private party then prepares an HCP assessing the potential for the project to adversely affect federally listed species and presenting the measures that will be undertaken to avoid and minimize such impacts.

Magnuson-Stevens Fishery Conservation and Management Act (**16 U.S.C. §§ 1801-1884)**. The Magnuson-Stevens Act of 1976 (as amended in 1996 and reauthorized in 2006) applies to fisheries resources and fishing activities in federal waters that extend to 200 miles offshore. Conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities are the main objectives of the legislation.

Section 305(b)(2)-(4) of the Magnuson-Stevens Act outlines a process for NMFS to comment on activities proposed by federal action agencies that may adversely impact areas designated as Essential Fish Habitat (EFH). Specifically, federal action agencies are required to consult with NMFS on any action authorized, funded, or undertaken that may adversely impact EFH. This consultation process is typically integrated into existing environmental review procedures in accordance with the National Environmental Policy Act, ESA, or Fish and Wildlife Coordination Act to provide the greatest level of efficiency. NMFS must provide the federal action agency with EFH consultation recommendations for any action that would adversely affect EFH. These recommendations are advisory in nature.

Marine Mammal Protection Act (16 U.S.C. § 1371). Under the Marine Mammal Protection Act (MMPA) of 1972 (as amended in 1994), it is unlawful to take or import marine mammals and marine mammal products. The Act defines "take" as "the act of hunting, killing, capture, and/or harassment of any marine mammal; or, the attempt at such." The MMPA defines harassment as "any act of pursuit, torment or annoyance which has the potential to either: a. injure a marine mammal in the wild, or b. disturb a marine mammal by causing disruption of behavioral patterns, which includes, but is not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." Under Section 101(a)(5)(D) of the Act, an Incidental Harassment Authorization Permit (IHA) may be issued for activities other than commercial fishing that may impact small numbers of marine mammals. An IHA covers activities that extend for periods of no more than 1 year and that will have a negligible impact on the impacted species.

Migratory Bird Treaty Act (16 U.S.C. §§ 703–711). The Migratory Bird Treaty Act (MBTA) of 1918 protects all migratory birds, including active nests and eggs. Birds protected under the MBTA include all native waterfowl, shorebirds, hawks, eagles, owls, doves, and other common birds such as ravens, crows, sparrows, finches, swallows, and others, including their body parts (for example feathers and plumes), active nests, and eggs. A

complete list of protected species is found at 50 CFR 10.13. Enforcement of the provisions of the MBTA is the responsibility of USFWS.

Clean Water Act Section 404; Rivers and Harbors Act of 1899 Section 10: Waters of the United States and wetlands. The purpose of the Clean Water Act (CWA) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." The definition of "waters of the United States" includes rivers, streams, estuaries, the territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR § 328.3 7b).

The Rivers and Harbors Act (33 U.S.C. § 403) addresses effects to navigable waters and regulates "excavation, fill, or alterations or modifications to the course, location, condition, or capacity of any port, …harbor, canal, lake, …or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States, unless the work has been recommended by the Chief of Engineers." Under Section 10 of the Rivers and Harbors Act, the U.S. Army Corps of Engineers (USACE) has the authority to regulate the navigable capacity of any of the waters of the United States.

Section 404 of the CWA prohibits fill of and dredging of waters of the U.S. without prior authorization from the USACE. The USACE issues permits based on guidelines established under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act. The U.S. Environmental Protection Agency (USEPA) also has authority over wetlands and has the authority to veto a USACE permit under Section 404(c).

Depending on the amount of impacts to waters of the U.S., a USACE Section 404 permit application can either: (1) invoke usage of any of the 50 Nationwide Permits (NWPs) issued on April 12, 2012 (Federal Register, Vol. 72, No. 47), or (2) entail the submittal of an individual permit application. If the project would have minimal individual and cumulative adverse effects on the aquatic environment, and if General Conditions are met, one (or more than one) of the NWPs could be used and a Pre-Construction Notification would be required. If an NWP does not apply, then an Individual Permit must be obtained.

All Section 404 CWA permit actions require water quality certification or a waiver pursuant to Section 401 of the CWA. This authority has been delegated by USEPA to the state level in California, and this certification or waiver is issued by the Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) and is discussed further in Section 3.9, Hydrology and Water Quality. The RWQCB has conditionally pre-certified certain of the NWPs.

Dredged Material Management Office. The Dredged Material Management Office (DMMO) is a joint program of the USACE, BCDC, RWQCB, State Lands Commission, and USEPA, with CDFG, USFWS, and NMFS participating by providing advice and expertise to the process. The purpose of the DMMO is to cooperatively review sediment quality sampling plans, analyze the results of sediment quality sampling, and make suitability determinations for material proposed for disposal in San Francisco Bay. The goal of this interagency group is to increase efficiency and coordination between the member agencies and to foster a comprehensive and consolidated approach to handling dredged material management issues. The DMMO has developed work windows that can be used for dredging activities within the Bay to minimize impacts on fish of sediment dredging. Dredge is defined as material excavated in waters. See also Section 3.9, Hydrology and Water Quality.

State or State Delegated

California Endangered Species Act (CESA) (CFGC §§ 2050-2098*).* Sections 2050-2098 of the California Fish and Game Code (CFGC) prohibit the take of state-listed endangered and threatened species unless specifically authorized by CDFG. The state definition of "take" is to hunt, pursue, catch, capture, or kill a member of a listed species or attempt to do so. CDFG administers the California Endangered Species Act (CESA) and authorizes take through permits or memoranda of understanding issued under Section 2081 of CFGC or through a consistency determination issued under Section 2080.1. A consistency determination allows CDFG to authorize a project to proceed if that agency agrees with terms and conditions developed for a federal Biological Opinion and Incidental Take Permit. Section 2090 of CFGC requires state agencies to comply with threatened and endangered species protection and recovery and to promote conservation of these species.

Fully Protected Species (CFGC §§ 3511, 4700, 5050, and 5515). CFGC designates certain animal species as "fully protected" under Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish). Fully protected species may not be taken or possessed at any time, and no permits may be issued for incidental take of these species. Fully protected species in the San Francisco Bay Area include species such as the California clapper rail (*Rallus longirostris obsoletus*), brown pelican (*Pelecanus occidentalis*), and peregrine falcon (*Falco peregrinus*). No fully protected fish species occur in San Francisco Bay.

Protection for Birds: (CFGC § 3503 et seq.). CFGC Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3513 makes it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

Native Plant Protection Act of 1973 (CFGC §§ 1900-1913*).* The Native Plant Protection Act of 1973 includes provisions that prohibit the taking of endangered or rare native plants from the wild and a salvage requirement for landowners. CDFG administers the Native Plant Protection Act of 1973 and generally regards as rare many plant species included on Lists 1A, 1B, and 2, and sometimes Lists 3 and 4, of the California Native Plant Society (CNPS) Inventory of Rare and Endangered Vascular Plants of California.

California Species of Special Concern. California species of special concern (SSC) is a category conferred by CDFG on those species that are indicators of regional habitat changes or considered potential future protected species. SSC do not have any legal status, but they are intended by CDFG for use as a management tool to take these species into special consideration when decisions are made concerning the future of any land parcel. SSCs should be considered during the environmental review process. CEQA (California Public Resources Code §§ 21000-21177) requires state agencies, local governments, and special districts to evaluate and disclose impacts from "projects" in the state. Section 15380 of the CEQA Guidelines clearly indicates that species of special concern should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein.

McAteer-Petris Act of 1965 (CGC §§ 66650-66661). The McAteer-Petris Act brought about the San Francisco Bay Conservation and Development Commission (BCDC), which is a state agency with permit authority over the Bay and its shoreline band. BCDC regulates filling, dredging, and changes in use in San Francisco Bay and development within 100 feet of the Bay.

The San Francisco Bay Plan (BCDC, 2011) specifies goals, objectives, and policies for existing and proposed waterfront land use and other areas under the jurisdiction of BCDC. One of the major policies of the San Francisco Bay Plan applicable to biological resources is associated with the effects of Bay filling. This policy states that Bay filling "…should be limited to purposes providing substantial public benefits if these same benefits could not be achieved equally well without filling" and that "filling destroys the habitat of fish and wildlife. Future filling can disrupt the ecological balance in the Bay, which has already been damaged by past fills, and can endanger the very existence of some species of birds and fish."

Local

Because the California Public Utilities Commission (CPUC) has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary regulations. The following analysis of local regulations relating to biological resources is provided for informational purposes and to assist with CEQA review.

City and County of San Francisco General Plan. The City and County of San Francisco are currently operating under a General Plan that was adopted in June 1996 and approved through the Board of Supervisors (San Francisco Planning Department, 2012). The General Plan goals, objectives, and policies pertaining to the comprehensive and long-range management, preservation, and conservation of open-space lands—including wildlife, vegetation, and wetland resources—most relevant to the project are listed below.

Environmental Protection, Objective 1: *Achieve a proper balance among the conservation, utilization, and development of San Francisco's natural resources.*

Policy 1.2: *Improve the quality of natural resources.*

Policy 1.3: *Restore and replenish the supply of natural resources.*

Policy 1.4: *Assure that all new development meets strict environmental quality standards and recognizes human needs.*

Environmental Protection – Bay, Ocean, and Shorelines, Objective 3: *Maintain and improve the quality of the bay, ocean, and shoreline areas.*

Policy 3.1: *Cooperate with and otherwise support regulatory programs of existing regional, State, and Federal agencies dealing with the Bay, Ocean, and Shorelines.*

Environmental Protection – Flora and Fauna, Objective 8**:** *Ensure the protection of plant and animal life in the city.*

Policy 8.1: *Cooperate with and otherwise support the California Department of Fish and Game and its animal protection programs.*

Policy 8.2: *Protect the habitats of known plant and animal species that require a relatively natural environment.*

Policy 8.3: *Protect rare and endangered species.*

3.4.2.2 Methodology

A desktop review of biological resources was conducted to develop a preliminary analysis of habitat types and their potential to support special-status species at the project site, including the underground portions, switchyard location, and submarine route. Field reconnaissance surveys were conducted by Garcia and Associates (GANDA) on May 21, 2012, and by CH2M HILL biologists on June 22, 2012.

Existing databases and resources were reviewed to compile a list of sensitive plant and animal species that are known to occur in the vicinity of the project. CDFG's California Natural Diversity Database (CNDDB) and the CNPS's Online Inventory of Rare and Endangered Plants of California were queried to identify rare federally- and state-listed species within a 5-mile buffer of the project routes (CDFG, 2012; CNPS, 2011). The project was also evaluated for the presence of critical habitat for threatened and endangered species by reviewing the online USFWS critical habitat portal (USFWS, 2011). In addition, environmental impact reports (EIRs) and permits for similar projects located near the project area were analyzed to determine the extent of, and potential impacts to, sensitive resources. These include the Trans Bay Cable EIR (City of Pittsburg, 2006), for a submarine cable that traverses a similar route to the proposed submarine route of the Embarcadero-Potrero 230 kV transmission line, and the America's Cup EIR (San Francisco Planning Department, 2011), which includes detailed biological information for the northern cable landing location proposed for this project as well as the surrounding terrestrial and marine areas.

A plant was considered to be of special status if it met one or more of the following criteria:

- Federally- or state-listed, or proposed for listing, as rare, threatened, or endangered (CDFG, 2012b).
- Special Plant as defined by the CNDDB.
- Listed by the CNPS in the online version of its *Inventory of Rare and Endangered Plants of California* (CNPS, 2011). Species designated as List 4 by the CNPS were also considered to be special-status.

Special-status wildlife included species that met one or more of the following criteria:

- Listed, proposed for listing, or candidates for listing as threatened or endangered under the ESA.
- Listed or candidates for listing as threatened or endangered under the CESA.
- Designated as Species of Special Concern or a fully protected species by the CDFG.
- Listed on the CDFG "Special Animals" list (CDFG, 2011).

- Otherwise meets the definition of rare, threatened, or endangered as described in the CEQA Guidelines, Section 15380. The CEQA Guidelines, Section 15380, include consideration of non-listed species. A species that is not listed will also be considered rare or endangered if it can be shown to meet one or more of the following criteria:
  - Its survival and reproduction in the wild are in immediate jeopardy from one or more causes.
  - It exists in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment deteriorates.
  - It is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

3.4.3 Existing Setting

The submarine portion of the proposed project is located in San Francisco County, south of the San Francisco-Oakland Bay Bridge. The proposed on-shore project sites, such as Embarcadero Substation, Potrero Switchyard, and cable transitions to underground, are located within the City of San Francisco. The proposed submarine route includes the Port and City of San Francisco waterfront sites, and the open-water region and shoreline areas of Central San Francisco Bay from Potrero Switchyard to the San Francisco-Oakland Bay Bridge.

The water in the Central Bay is typically colder and more saline than other regions of the San Francisco Bay and Delta due to its proximity to the mouth of the Bay. Average water temperatures of the Central Bay range from 51°F (10.4°C) in the winter, to an average of 60°F (15.8°C) in the summer (San Francisco Bay Area Wetlands Ecosystem Goals Project, 1999).

3.4.3.1 Terrestrial Natural Communities

No natural vegetation community types occur within the on-shore project sites. On-land or shoreline portions of the proposed project are located in city streets or disturbed areas on the waterfront of the City of San Francisco. These areas are largely urbanized, with biological resources limited to street trees and a very few isolated, extremely disturbed patches of ruderal habitat that could potentially support nesting birds seasonally. Vegetation along The Embarcadero is limited to palm trees (*Arecaceae*), sycamores (*Platanus* sp.), and a variety of other ornamental plantings.

The two cable landing locations and adjacent lands are largely hardscaped and highly urbanized. The horizontal directional drilling (HDD) will pass under the shoreline at the southern cable landing location at PG&E's Potrero Switchyard, which is covered in riprap. Vegetation is largely limited to ornamental shrubs and trees around Potrero Switchyard, with many areas completely free of vegetation and paved. No wetlands are found along the proposed submarine cable route; the nearest known wetland is near Pier 96, the result of subsided dredged and fill materials, about 0.5 mile south of Potrero Switchyard (San Francisco Planning Department, 2011). The northern cable landing location (N2) is located between Piers 28 and 30, and all surrounding areas are paved, as shown in Figure 3.4-1. The HDD will pass under the seawall at this location, terminating at the cul de sac on Spear Street.

Proposed Transmission Line

Substation/Switchyard

Central California Coast Steelhead DPS and Green Sturgeon Critical Habitat

N

Scale: 1:20,000

0 750 1,500 Feet

FIGURE 3.4-1

Critical Habitat

Embarcadero-Potrero 230 kV Transmission Project

San Francisco, CA

3.4.3.2 Marine Habitats

Marine habitat types present within the proposed submarine area include natural and artificial intertidal, subtidal, and open-water habitats. The project stretches between the shoreline immediately east of the PG&E Potrero Switchyard northward towards Pier 30 south of the San Francisco-Oakland Bay Bridge, and extending eastward approximately 2,000 feet offshore. Marine habitats and associated marine communities present in this area include natural (rock) and artificial (concrete, rock riprap, wood, and concrete pilings) hard intertidal areas near shore; soft substrate subtidal habitat; and open water (NMFS, 2007a; State of California Coastal Conservancy, 2010). The Bay depth in the proposed project area is about 10 feet along the east-west portion near the Potrero Power Plant and trends from about 30 feet deep along the south to about 70 feet deep along the northern portion of the proposed submarine route (see also Section 3.9, Hydrology and Water Quality).

3.4.3.3 Intertidal Habitat

The project crosses the Bay shoreline and intertidal habitat as an HDD, averaging about 40 to 50 feet below the water surface. Intertidal habitat located along the proposed project consists of riprap and soft-bottom mud at the southern cable landing and pavement, ports, wharfs, and soft-bottom mud at the northern cable landing. No natural rocky areas, sandy beaches, or wetlands are located along the shore at proposed route. The northern end crosses under a seawall at Berth 30, and the southern HDD crosses under riprap.

3.4.3.4 Subtidal Habitat

Subtidal habitat, as defined in the San Francisco Bay Subtidal Habitat Goals report, includes "all of the submerged area beneath the bay's water surface: mud, shell, sand, rocks, artificial structures, shellfish beds, eelgrass beds, macroalgal beds, and the water column above the bay bottom" (State Coastal Conservancy [SCC], 2010). The habitat types encountered along the proposed project consist of soft-bottom mud and sandy habitats and the water column above them (see Figure 3.4-2). No eelgrass (*Zostera marina*) beds, shell, or rock are found along the proposed route, nor are there any planned eelgrass or shell bed restoration projects in the area according to the interactive maps available on the Subtidal Habitat Goals Project Web site (SCC, 2012).

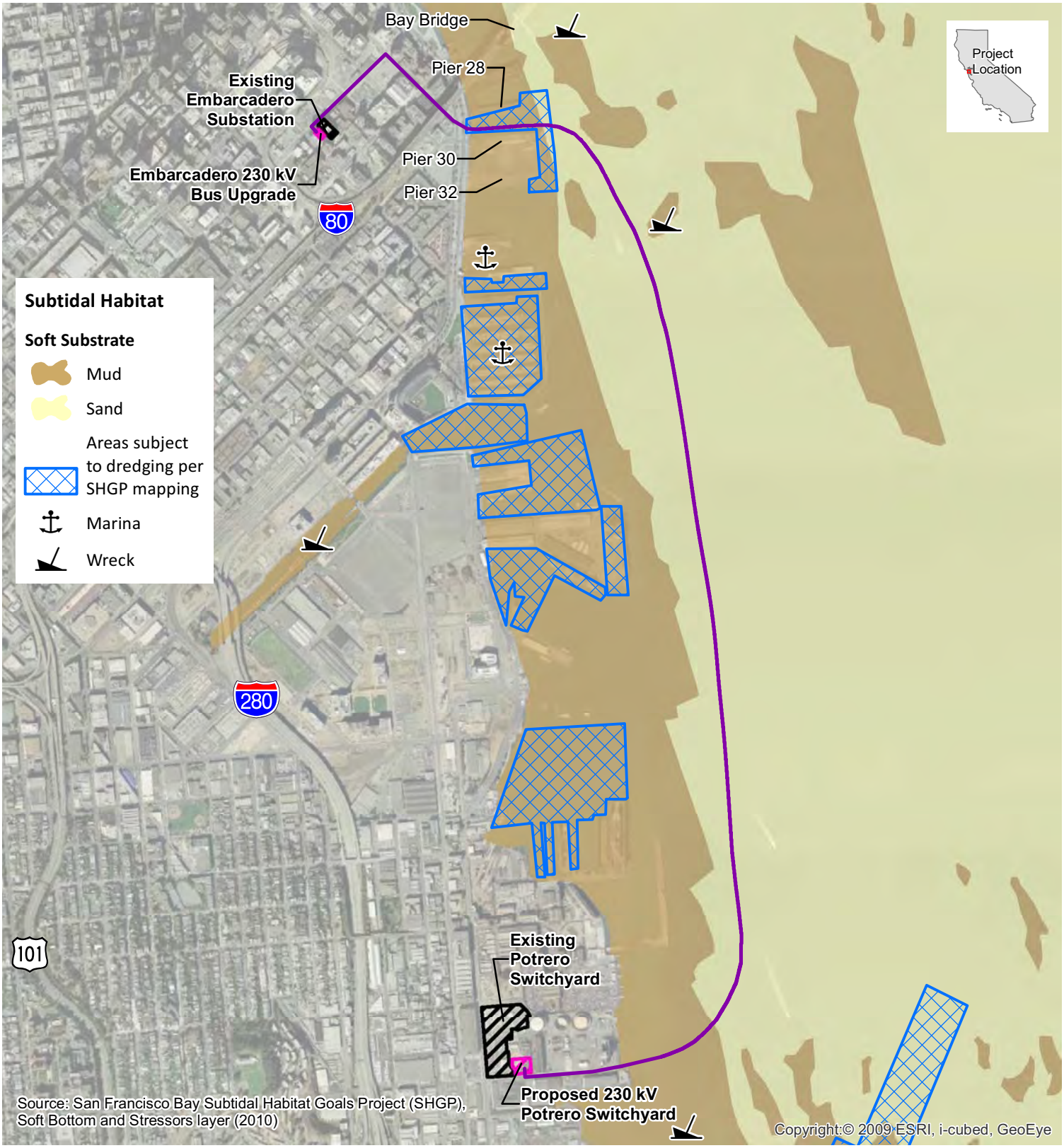
The submarine cable will be placed in the sediments of San Francisco Bay using a hydroplow towed by a barge. The Bay habitats in the construction zone include subtidal open-water and bottom-sediment habitat. No piles will be used as part of this project. The HDD will pass under the riprap and seawall found on the shoreline.

No special aquatic sites (wetlands, eel grass beds) are found in the project area. Eelgrass is a sensitive marine habitat found in the San Francisco Bay and Delta. Eelgrass is a shallow subtidal/intertidal flowering plant found inhabiting bays, estuaries, and the leeside of islands, and bed locations and size are determined by water depth and turbidity. Eelgrass beds can only become established in those areas of the Bay/Delta where water depth and turbidity allow light to penetrate to the seafloor, generally in less than 10 feet of water (Merkel and Associates, 2004).

No known eelgrass beds are present along the proposed submarine cable route according to the Trans Bay Cable EIR (City of Pittsburg, 2006), America's Cup EIR (San Francisco Planning Department, 2011), and the San Francisco Bay eelgrass inventories (Merkel and Associates, 2004, 2010). For the Trans Bay Cable, the Potrero Switchyard landing location was chosen due to the low potential for eelgrass beds to establish in the area (City of Pittsburg, 2006).

The soft-bottom habitats along the proposed route consist of mud and sandy substrates, the organisms living on those substrates, and the water column above the Bay bottom. The habitat in the water column is also referred to as the pelagic zone. Figure 3.4-1 shows the habitat types along the project, as well as areas within the vicinity of the project that are subject to planned dredging projects. Fine-grained sediment is generally stable enough to support diverse benthic organisms; sandy-bottom habitat, however, may support fewer benthic resources than mud bottoms.

Fine-grained sediments support microbial activity and deposition of organic matter, supporting infauna (organisms living in the sediments), epifauna (those living on the sediment surface), and demersal species (fish or macroinvertebrates associated with the sediment surface). Benthic organisms in turn support predators in the



Proposed Transmission Line

Substation/Switchyard

N

Scale: 1:20,000

0 1,000 2,000 Feet

FIGURE 3.4-2

Subtidal Habitat

Embarcadero-Potrero 230 kV Transmission Project

San Francisco, CA

overlying water column (SCC, 2010), including demersal species such as elasmobranchs (rays and sharks), sturgeons, and halibut.

3.4.3.5 Special-Status Species

The CNDDB database search identified 49 listed terrestrial species within 5 miles of the proposed project. The database results and summary of records for special-status plant and wildlife species in the project vicinity are provided in Appendix B.

A number of special-status marine species, including fish and marine mammals, occur in San Francisco Bay. According to the America's Cup EIR (San Francisco Planning Department, 2011), 33 species of fish have been documented inhabiting Central Bay pelagic waters in recent years, of which three species account for 99 percent of the total abundance of fish regularly sampled in both the deep water and shallow areas of the Central Bay. Northern anchovy (*Engraulis mordax*) is the overwhelming dominant species, accounting for up to 94 percent of those fish inhabiting the water column. Pacific herring (*Clupea pallasii*) and jacksmelt (*Atherinopsis californiensis)* are the second and third most common fish taxa in Central Bay waters, together accounting for an additional 5 percent of the fish sampled annually. The remaining 30 species collectively account for less than 1 percent of the fish species present annually. Important managed fish species or sensitive species of concern that are present in Central Bay pelagic waters include Northern anchovy, longfin smelt (*Spirinchus thaleichthys*), Chinook salmon (*Oncorhynchus tshawytscha*), Pacific sardine, (*Sardinops sagax*), and English sole (*Parophrys vetulus*).

The entire San Francisco Bay has been designated critical habitat for the North American green sturgeon (*Acipenser medirostris*) southern Distinct Population Segment (DPS) (federally threatened, state species of special concern) and for the Central California Coast steelhead (*Oncorhynchus mykiss irideus*) DPS (federally threatened) (see Figure 3.4-1); the proposed marine route passes through this designated critical habitat. The longfin smelt is listed as a threatened species under CESA, is a candidate for listing under the federal ESA, and may be found throughout the Bay. This species could potentially be found in the project area, typically in the mid to lower water column. These and other species are discussed further below.

Special-Status Terrestrial Species. Based on field reconnaissance surveys, the proposed project vicinity does not offer suitable terrestrial habitat for any of the 49 listed wildlife or plant species identified within 5 miles of the proposed project. Overall, the structural attributes within the proposed project area (that is, buildings and piers) have limited value for wildlife (San Francisco Planning Department, 2011). Pre-construction bird nesting and bat surveys will be conducted as needed depending on location and timing of final work.

Special-Status Marine Species. Twelve special-status marine species have potential to occur within the proposed submarine cable route. Of these, nine have a high to moderate potential to forage or move through the proposed project area, as described below.

Managed fish species covered under the Magnuson-Stevens Act also have potential to occur within the proposed submarine cable route. EFH is defined as those waters, aquatic areas, and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH Guidelines (NMFS, 2004) include in their definition of EFH:

1. "Aquatic areas" and their associated physical, chemical, and biological properties are areas that are used by fish and may include aquatic areas historically used by fish, where appropriate.
2. "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities.
3. "Necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem.
4. "Spawning, breeding, feeding, or growth to maturity" covers a species' full lifecycle.

These managed fish species include the following:

- Northern anchovy (*Engraulis mordax*)
- Pacific sardine (Sardinops sagax)
- English sole (Parophrys vetulus)
- Sand sole (*Psettichthys melanostictus*)
- Curlfin sole (*Pleuronichthys decurrens*)
- Pacific sanddab (*Citharichthys sordidus*)
- Starry flounder (*Platichthys stellatus*)
- Lingcod (*Ophiodon elongates*)
- Brown rockfish (*Sebastes auriculatus*)
- Pacific whiting (*Merluccius productus*)
- Kelp greenling (*Hexagrammos decagrammus*)
- Leopard shark (*Triakis semifasciata*)
- Spiny dogfish shark (*Squalus acanthias*)
- Soupfin shark (*Galeorhinus galeus*)
- Bocaccio rockfish (*Sebastes paucispinis*)
- Cabezon (*Scorpaenichthys marmoratus*)

The nine special-status marine species (six fish species and three marine mammals) that have been documented to occur in the proposed project area or have a high or moderate potential to occur—green sturgeon, Central California Coast coho salmon (*Oncorhynchus kisutch*), Chinook salmon, California central coast steelhead, longfin smelt, Pacific herring (*Clupea pallasii*), Pacific harbor seal (*Phoca vitulina richardsi*), California sea lion (*Zalophus californianus*), and harbor porpoise (*Phocoena phocoena*)—are discussed below.

North American Green Sturgeon – Federally Threatened, State Species of Special Concern. Green sturgeon is an anadromous fish which occupies bays and estuaries along the western coast of the United States (Moyle et al., 1995). The southern DPS consists of the coastal and Central Valley populations of the Eel River, with the only known spawning population occurring in the Sacramento River. The precise abundance of green sturgeon in the San Francisco Bay and its tributaries is unknown (NMFS, 2005). Adult green sturgeon migrate from the ocean into the San Francisco Bay in late February heading for the Sacramento River, with spawning occurring in cool sections of the Sacramento River from March through July, and peak activity in April and June (Heublein et al., 2009). Green sturgeon use both freshwater and saltwater habitat. They spawn in deep pools or holes in large, turbulent, freshwater river mainstems (Moyle et al., 1995). Juvenile and subadult green sturgeon use the San Francisco Bay as rearing and migration habitat.

Critical habitat in the form of foraging or rearing habitat for green sturgeon occurs along the proposed submarine cable route, since the entire Bay is considered critical habitat. There is no known spawning habitat for this species within San Francisco Bay. The project is outside the major migratory corridor for this species, from the Golden Gate to San Pablo Bay and the Delta.

Central California Coast Coho Salmon – Federally Endangered, State Endangered. After heavy late fall/winter rains, adult Coho salmon from the Central California Evolutionarily Significant Unit (ESU) migrate from the ocean through San Francisco Bay and spawn in tributaries of the Sacramento River or San Joaquin Delta. Juvenile Coho have potential to occur in San Francisco Bay in the fall, winter, and spring (San Francisco Planning Department, 2011). Suitable foraging habitat occurs along the proposed submarine route; however, no known spawning streams exist in the vicinity of the proposed project area (Leidy et al., 2005).

Chinook Salmon – Winter-Run Federally Endangered; Spring-Run Federally Threatened. Adult Chinook salmon migrate from the ocean through the San Francisco Bay to spawn upstream in the Sacramento and San Joaquin River basins. Spawning occurs as four distinct runs: winter-, spring-, fall-, and late fall-run ESUs. The winter-run ESU is listed as endangered, and the spring-run is listed as threatened. There are no known spawning streams in the vicinity of the proposed project area (CNDDB, 2012). Critical habitat for the spring-run Chinook is north of the Bay Bridge. Adults are found in San Francisco Bay during the migratory period in the spring, and juveniles have the potential to inhabit the Bay in the fall, winter, and spring. Spring-run Chinook may occur in the Central Bay and in the vicinity of the project area in low numbers (San Francisco Planning Department, 2011).

For Central Valley fall-run and late-fall run Chinook salmon, the primary migration corridor to the ocean is through the northern reaches of Central San Francisco Bay: Raccoon Strait and north of Yerba Buena Island (San Francisco Planning Department, 2011). The project is outside the migratory corridor for these runs. A report in preparation for the Port of San Francisco referenced in the America's Cup EIR (San Francisco Planning Department, 2011) evaluated 30 years of fish trawl data and three years of acoustic tag data of hatchery-raised salmonids, and suggests that the presence of out-migrating juvenile salmonids (steelhead and salmon) along the Port of San

Francisco waterfront appeared to be more the result of capture by tidal flow rather than active foraging or intentional swimming to those areas of the Bay. This study also concluded that the amount of time juvenile salmonids were present in the waters adjacent to the Port was very short and not representative of any foraging behavior.

Central California Coast Steelhead Trout – Federally Threatened. The Central California Coast steelhead trout DPS distribution ranges along the California coast from the Russian River south to Aptos Creek in Santa Cruz County. This anadromous trout occurs in rivers and bay basins with shaded pools of small, cool, low-flow upstream reaches. Steelhead trout spend part of their life at sea but return to freshwater to spawn in gravel beds in rivers or streams. Generally, coastal California steelhead live in freshwater for 2 years, then spend 1 or 2 years in the ocean before returning to their natal stream to spawn. Peak spawning in California occurs from December to April (McEwan, 2001). Steelhead fry generally rear in edgewater habitats and move gradually into pools and riffles as they grow larger. Cover is an important habitat component for juvenile steelhead, both as a velocity refuge and as a means of avoiding predation (Shirvell, 1990). Steelhead trout typically hatch in 30 days, depending on the water temperatures, and fry emerge from the gravel generally 4 to 6 weeks after hatching (Leitritz and Lewis, 1980). Currently, stream-maturing steelhead (summer steelhead) are found only in north coast drainages (that is, the Eel, Klamath, and Trinity River systems) and ocean-maturing steelhead (winter steelhead) are present both in north coast drainages and in the Central Valley and central and south coast drainages (McEwan, 2001).

Critical habitat for Central California Coast steelhead occurs along the proposed submarine cable route. Central California Coast steelhead trout are rare in most streams that are tributary to the San Francisco Bay (San Francisco Planning Department, 2011). Suitable foraging habitat exists along the proposed submarine route. No known spawning streams exist in the vicinity of the proposed project.

Longfin Smelt – State Threatened and Candidate for Listing by USFWS. Longfin smelt are found in California's bay, estuary, and nearshore coastal environments from San Francisco Bay north to Lake Earl, near the Oregon border. Given the small size of the fish and the long distances between estuaries, the San Francisco Bay-Delta population was determined to be markedly separated and therefore discrete from other populations along the west coast (USFWS, 2012). They are an anadromous, euryhaline species (tolerate a wide range of salinities) and typically have a 2-year lifecycle, although some individuals live to 3 years. Longfin smelt spawn in the middle Delta in winter and distribute themselves throughout the San Francisco Bay estuary as they mature. In the early spring/summer (April-June), they concentrate in San Pablo Bay and move in to San Francisco Bay later in the summer (Moyle, 2002). Longfin smelt are known to inhabit all of the waters in the Central Bay, including the waters adjacent to the Port of San Francisco (San Francisco Planning Department, 2011).

The CDFG established the San Francisco Bay Study (Bay Study) in 1980 to determine the effects of freshwater outflow on the abundance and distribution of fish and mobile crustaceans in the San Francisco Estuary. CDFG collected specific monthly abundance and size data for the longfin smelt using two methods of trawling. Seven years of data from 2006 to 2012 were analyzed from two data collection stations (Stations 109 & 110) that are in similar locations to the proposed project area, adjacent to the shoreline along the east side of San Francisco. Station 109 is located approximately 2,000 feet offshore between Potrero Switchyard and Hunter's Point, and Station 110 is located approximately 4,000 feet offshore of Piers 30 and 32. These data are summarized in Table 3.4-2.

For the America's Cup EIR, based on the Central Bay location of proposed dredging, and dredging during the late summer and fall months in accordance with work windows defined in the Long-term Management Strategy (LTMS) and LTMS management Plan (USEPA et al., 1996; USACE et al., 2001), with the low risk of entrainment posed by clamshell dredging and the absence of the most sensitive life history stage (smelt eggs) in the Central Bay during summer and fall months when that project's dredging would occur, including near Piers 30 and 32, the potential threat to longfin smelt was judged less than significant, no take of fish was expected, and no mitigation was required.

Spawning habitat for the longfin smelt does not exist in the vicinity of the proposed project area, since longfin smelt spawn in the Delta (USFWS, 2012). Suitable foraging habitat exists in San Francisco Bay, and therefore

along the proposed submarine route (USFWS, 2012). Longfin smelt are typically found in the middle to lower water column except at night when they migrate to the surface waters. However, as shown in Table 3.4-2, the density of longfin smelt in the vicinity of the project area can be expected to be quite low.

TABLE 3.4-2
Longfin Smelt Sampled in Vicinity of Proposed Project Area, 2006-2012
Embarcadero-Potrero 230 kV Transmission Project

Station	Year	Longfin Smelt < 60 mm (Average Catch per Unit Effort)	Longfin Smelt > 60 mm (Average Catch per Unit Effort)
Station 109	2006	3.9	1.6
	2007	0	0.54
	2008	5.0	0
	2009	0	0.625
	2010	1.2	0
	2011	0	0
	2012	0	0.15
Station 110	2006	18.8	0
	2007	0.76	4.6
	2008	21.7	1.2
	2009	1.8	3.8
	2010	.4	.4
	2011	6.1	14.0
	2012	1.0	2.7

Notes:
Smelt counts are averaged between midwater trawl and otter trawl surveys.
Source: CDFG, 2012a.

Pacific Herring – Species of Interest. Pacific herring is not listed under the ESA or CESA but is a species of special interest for San Francisco Bay since it is an important member of the San Francisco Bay marine ecosystem; provides an important food source for marine mammals, sea birds, and fish; and constitutes a state fishery that is entirely conducted within an urban estuary, making it particularly susceptible to anthropogenic impacts. As a state fishery, it is regulated under Sections 8550-8559 of the CFGC (Bartling, 2006).

Pacific herring spawning areas are characterized as having reduced salinity, calm and protected waters, and spawning-substrate such as marine vegetation or intertidal areas. The largest spawning aggregations of Pacific herring in California occur in San Francisco and Tomales Bays. Beginning as early as October and continuing as late as April, schools of adult herring migrate inshore to bays and estuaries to spawn. Schools first appear in the deep-water channels of bays, where they can stay for up to 2 weeks as their gonads mature, before moving into shallow areas to spawn. Females extrude adhesive eggs onto a variety of surfaces including vegetation, rocks, and constructed structures such as pier pilings, boat bottoms, rock riprap, and breakwaters. The proposed submarine cable route is located in a calm and protected area with reduced salinity, has suitable spawning habitat for Pacific herring, and is an area known for yearly herring spawns; the entire proposed submarine project area is considered fish spawning habitat for Pacific herring (Bartling, 2006; City of Pittsburg, 2006). The typical work window to avoid impacts to herring spawns in the Bay is from December 1 to February 28. Figure 3.4-3 shows the spawning extent of Pacific herring in the San Francisco Bay.

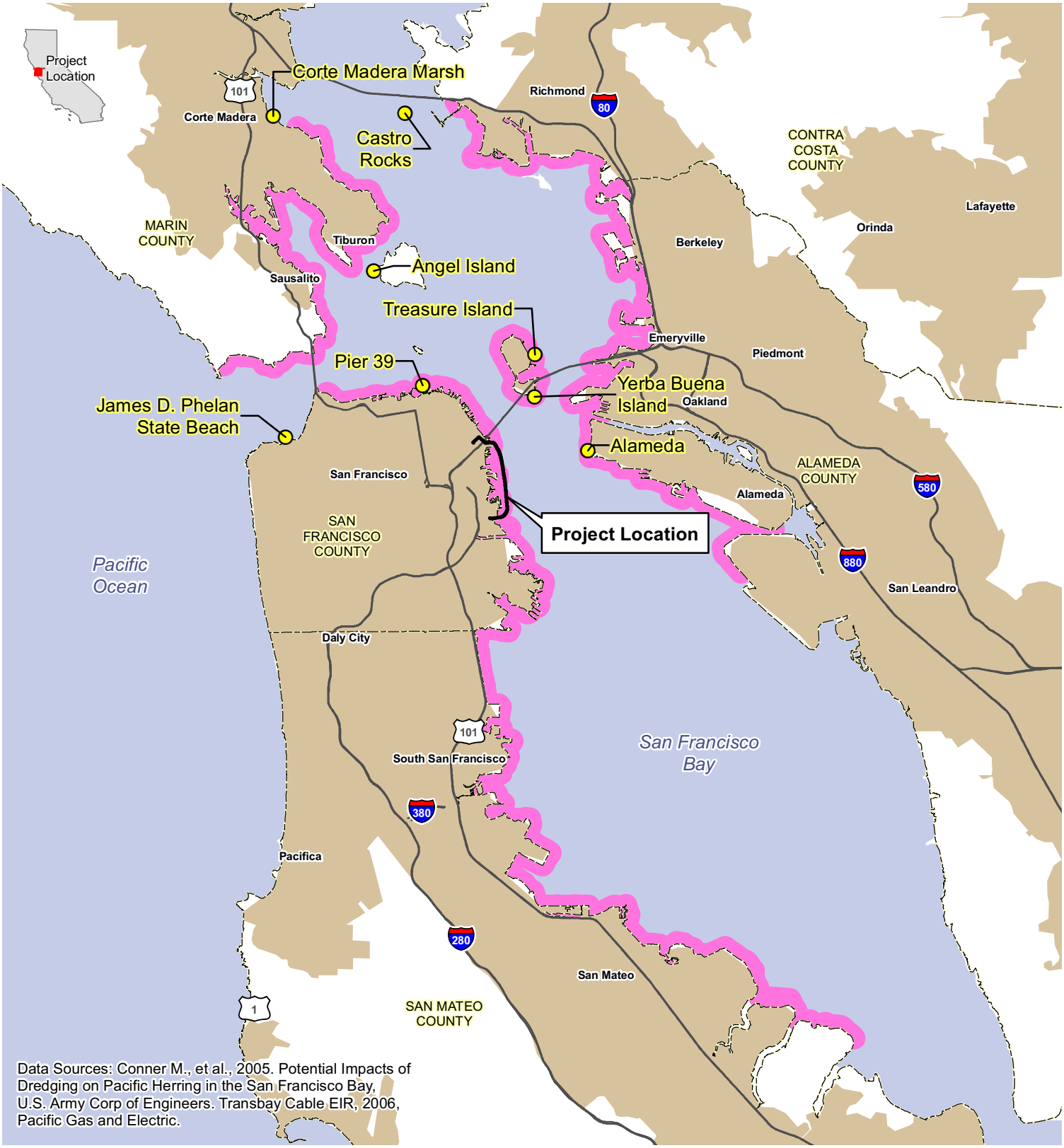


FIGURE 3.4-3
Herring Spawning Locations and Seal Haulout Sites in the San Francisco Bay
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

Pacific Harbor Seal – Federal Protection under Marine Mammal Act. The Pacific harbor seal has a wide range along the coast, islands, and bays of California. This species is the only marine mammal species known to occur as a permanent resident in the San Francisco Bay (NMFS, 2012a). Figure 3.4-3 shows known Pacific harbor seal haul-out locations in the vicinity of the proposed project area; the closest haul-out site is located on Yerba Buena Island approximately 2 miles to the northeast and is most frequently used during the winter months (Bohorquez, 2002). Harbor seals typically forage in the deepest waters of the Bay on a variety of fish, including perch, gobies, herring, and sculpin. During herring spawning, adult seals have also been observed covered with herring eggs at Castro Rock and Yerba Buena haul-out sites (Grigg et al., 2009). The harbor seal is not listed under the under the ESA or considered a strategic stock under the MMPA. This species is expected to occur in the vicinity of the proposed project, either as foraging or passing through the waters along the proposed submarine cable route.

California Sea Lion – Federal Protection under Marine Mammal Protection Act. California sea lions use San Francisco Bay for refugia and foraging, but not for breeding or pupping (NMFS, 2007c). They are the primary marine mammal sighted in the proposed submarine project area. Sea lions often use anthropogenic structures such as boat docks and navigational buoys as haul-out areas. However, California sea lions are not known to regularly use any structure near the proposed cable route for haul-out (NMFS, 2007c). Figure 3.4-3 shows known California sea lion haul-out locations in the vicinity of the proposed project area. Typically, sea lion numbers fluctuate with the abundance of herring in the area (San Francisco Planning Department, 2011). Suitable foraging habitat for California sea lion occurs along the proposed submarine route and California sea lions are expected to occasionally forage or pass through the water along the proposed submarine cable route (San Francisco Planning Department, 2011). In the U.S., California sea lions are not listed under the ESA, considered depleted under the MMPA, or considered a strategic stock under the MMPA (NMFS, 2007c).

Harbor Porpoise – Federal Protection under Marine Mammal Protection Act. The harbor porpoise occurs in northern temperate and subarctic coastal and offshore waters. In the North Pacific, this species ranges from Japan to the Chukchi Sea and from Monterey Bay, California to Beaufort Sea (San Francisco Planning Department, 2011). Harbor porpoise are commonly observed in bays, estuaries, and harbors less than 650 feet in depth, similar to the San Francisco Bay/Delta. Three stocks are considered strategic by NMFS, none of which are in California: the Bering Sea, Gulf of Alaska, and Southeast Alaska stocks (NMFS, 2012a). Harbor porpoises have recently been observed to have returned to the San Francisco Bay to forage after not having been observed in the bay for the last 65 years (American Cetacean Society, 2012). It is a near-shore species, observed near the Golden Gate Bridge and areas of the Central Bay. The Golden Gate Cetacean Research Organization started a multiyear assessment of the population abundance in the Bay. Recent observations of harbor porpoises have been reported near Tiburon and Angel Island (Perlman, 2010). The primary food sources for harbor porpoise are fish and squid. There have been no known reports of harbor porpoise in the vicinity of the proposed submarine route; the closest known observation is off the south side of Yerba Buena Island 1.8 miles to the northeast (California Department of Transportation, 2006). Harbor porpoises are expected to have the potential to occur only incidentally in the proposed submarine project area.

3.4.4 Applicant-Proposed Measures and Potential Impacts

3.4.4.1 Significance Criteria

According to Section 15002(g) of the CEQA Guidelines, "a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project." As stated in Section 15064(b) of the CEQA Guidelines, the significance of an activity may vary with the setting. Per Appendix G of the CEQA Guidelines, the potential significance of project impacts on biological resources were evaluated for each of the criteria listed in Table 3.4-1, as discussed in Section 3.4.4.3.

3.4.4.2 Applicant-Proposed Measures

PG&E will implement the APMs listed below to minimize impacts on biological resources:

APM Biological Resources (BIO)-1: General Measures. Environmental awareness training will be conducted for onsite construction personnel prior to the start of construction activities. The training will explain the APMs and any other measures developed to prevent impacts on special-status species, including nesting birds. The training

will also include a description of special-status species and their habitat needs, as well as an explanation of the status of these species and their protection under the ESA, CESA, and other statutes. A brochure will be provided with color photos of sensitive species, as well as a discussion of any permit measures. A copy of the training and brochure will be provided to CPUC at least 30 days prior to the start of construction for project files. This APM also includes the following measures:

- Biological monitor: A qualified biological monitor will verify implementation and compliance with all applicant-proposed measures. The monitor will have the authority to stop work or determine alternative work practices where safe to do so, as appropriate, if construction activities are likely to impact sensitive biological resources.
- Litter and trash management: All food scraps, wrappers, food containers, cans, bottles, and other trash from the project area will be deposited in closed trash containers. Trash containers will be removed from the project area at the end of each working day.
- Parking: Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed or developed areas or work areas as identified in this document.
- Pets and firearms: No pets or firearms will be permitted at the project site.

APM BIO-2: Preconstruction Surveys.

Preconstruction bird nesting surveys will be conducted in the project area no more than 15 days before work is performed in the nesting season February 1 to August 15. Surveyors will search for all potential nest types (e.g. ground, cavity, shrub/tree, structural, etc.) and determine whether or not the nest is active. A nest will be determined to be active if eggs or young are present in the nest. Upon discovery of active nests, appropriate minimization measures (e.g., buffers or shielding) will be determined and approved by the biologist. PG&E's biological monitor will determine the use of a buffer or shield and work may proceed based upon: acclimation of the species or individual to disturbance, nest type (cavity, tree, ground, etc.), and level and duration of construction activity.

In the unlikely event a listed species is found nesting nearby in this urban environment, CDFG and USFWS will be notified if a nest of a listed species is identified in the area of analysis, and the CPUC will be provided with nest survey results, if requested. When active nests are identified, monitoring for significant disturbance to the birds will be implemented.

Nest checks will occur each day construction is occurring, documented in a nest check form to be included in the Worker's Environmental Awareness Training package. Typically a nest check will have a minimum duration of 30 minutes, but may be longer or shorter, or more frequent than one check per day, as determined by PG&E's biological monitor based on the type of construction activity (duration, equipment being used, potential for construction-related disturbance) and other factors related to assessment of nest disturbance (weather variations, pair behavior, nest stage, nest type, species, etc.). The biological monitor will record the PG&E construction activity occurring at the time of the nest check and note any work exclusion buffer in effect at the time of the nest check. Non-PG&E activities in the area should also be recorded (e.g. adjacent construction sites, roads, commercial/industrial activities, residential activities, etc.). The biological monitor will record any sign of disturbance to the active nest, including but not limited to parental alarm calls, agitated behavior, distraction displays, nest fleeing and returning, chicks falling out of the nest or chicks or eggs being predated as a result of parental abandonment of the nest. Should the PG&E biological monitor determine project activities are causing or contributing to nest disturbance that might lead to nest failure, the PG&E biological monitor will coordinate with the Construction Manager to limit the duration or location of work, and/or set other limits related to use of project vehicles, helicopters, chainsaws, and/or heavy equipment. Should PG&E's biological monitor determine that project activities are not resulting in significant disturbance to the birds, construction activity will continue and nest checks while work is occurring will be conducted periodically.

APM BIO-3: Seasonal Work Windows. Where feasible, hydroplow cable installation will be conducted between March 1 and November 30, based on the seasonal work windows for steelhead, Chinook salmon, and Pacific herring (USEPA et al., 1996). If work is planned to occur outside of this work window, PG&E will coordinate any additional measures, such as monitoring for herring spawn, with NMFS, USFWS, and CDFG.

APM BIO-4: Herring Spawning Protection. If work occurs within the Bay in December, January, or February, a qualified observer shall monitor hydroplow and HDD connection activities when in proximity (about 660 to 980 feet, or 200 to 300 meters) to potential Pacific herring spawning sites. Herring spawning sites are generally located in shallow water near the surface, and are visible as a large mass of herring eggs, which are adhesive, and attach most commonly to eelgrass or other algae, and can also attach to piers and other features; no eelgrass beds occur in the work areas. If herring spawning sites are observed within 660 feet (200 meters) of the work site by a qualified monitor stationed on a nearby boat, pier, or beach, all in-water activities such as hydroplowing shall be stopped within that distance or as otherwise specified by the resource agencies for 2 weeks.

APM BIO-5: Aquatic Habitat Protection. PG&E will acquire the necessary permits to conduct cable installation activities in the San Francisco Bay. PG&E will comply with all conditions and requirements of these permits and certification.

APM BIO-6: Fish Screen. All hydroplow water jet intakes will be covered with a mesh screen to minimize the potential for impingement or entrainment of fish species.

3.4.1.1 Potential Impacts

Construction impacts can be temporary or permanent, and direct or indirect. Temporary impacts include impacts such as disturbance to wildlife from noise and human activity during the construction period. Examples of permanent impacts would be a loss of habitat due to facility or right-of-way construction, or substantial habitat modification resulting in different species composition. Direct impacts from construction can include mortality due to collision with vehicles or equipment. Indirect impacts can occur from effects such as displacement due to habitat modification or habitat fragmentation, or due to the effects of erosion and sedimentation affecting habitat.

The project will have no impacts to biological resources along the onshore underground routes, with the possible exception of disturbance to nesting birds during construction, should there be any found in the urban area landscaping along the route. The modification of the existing Potrero Switchyard and construction of the new 230/115 kV switchyard will occur in areas that are already disturbed and heavily urbanized, and have little wildlife value. Potrero Switchyard modifications will occur in an area that is currently paved. The two cable landing locations and adjacent lands are also largely paved and highly urbanized.

HDD would be used at each cable landing location to transition the cable from the onshore segment to the Bay bottom. This operation is largely land-based, and it avoids direct disturbance of shoreline, intertidal, and nearshore habitat. HDD could result in the inadvertent release of drilling fluid (frac-out), which could have the potential to affect water quality within the Bay. Water quality protection measures, including an HDD monitoring and management plan are discussed more fully in Section 3.9, Hydrology and Water Quality. Potential impacts to fish species are expected to be limited to temporary displacement due to disturbance during construction from hydroplowing and HDD tie-in activities.

Within aquatic environments, a hydroplow will be employed to bury the cable at a depth of 6 to 10 feet within the substrate. The hydroplow works by fluidizing the seabed material in a narrow path (approximately 1 foot wide) and lays the cable at the target depth. After laying the cable, the trench naturally closes, the fluidized sediments redeposit and partially collapse, and the remaining portion of the trench fills in through natural sediment deposition. The cable-laying ship and hydroplow travel at approximately 1 to 2 miles per day. Localized short-term increases in turbidity are expected, but due to the limited area of disturbance (estimated at 13,200 square feet of the approximately 400-square-mile Bay [NMFS, 2007a], or approximately one millionth of the Bay's area) and low speed of the hydroplow, it is very unlikely that there would be permanent or long-term impacts to turbidity due to cable installation and associated turbidity (City of Pittsburg, 2006a and b). This method is a very low-impact method to achieve the installation of the submarine cable (City of Pittsburg, 2006a and b).

Installation of the cable using the hydroplow will have a less-than-significant impact on commercial and recreational fishing. With implementation of APMs BIO-3, -4, and -5, installation of the cable would have a less-than-significant impact. Where feasible, hydroplow cable installation will be conducted between March 1 and November 30 based on the seasonal work windows for steelhead, Chinook salmon, and Pacific herring (USEPA et al., 1996). Potential project-related impacts to commercial fishing operations could occur if the offshore submarine cable system installation activities coincided in time and place with commercial herring fishing/harvesting operations in the Bay. If work occurs within the Bay when herring are spawning (December, January, or February), a qualified observer shall monitor hydroplow and HDD connection activities when in proximity to potential Pacific herring spawning sites as described in APM BIO-4. If herring spawning sites are observed within proximity of the work site, all in-water activities such as hydroplowing shall be stopped when safe to do so within 660 feet or as otherwise specified by the resource agencies, for a period of two weeks. PG&E will acquire the necessary permits to conduct cable installation activities in San Francisco Bay. PG&E will comply with all conditions and requirements of these permits and certification.

The hydroplow activity could result in very localized loss of foraging habitat for some fish, cause short-term and localized increased water turbidity, and result in exposure to sediment-affiliated organic and inorganic contaminants from resuspended sediments. The hydroplow will have a localized effect disrupting benthic habitats and organisms in the immediate vicinity of the plow, for a total of estimated 13,200 square feet, and resulting in a very localized mixing of sediments. Fish species would be expected to move away from the area of the hydroplow, which moves slowly along the bottom. Benthic organisms would be expected to rapidly recolonize the sediments after passage of the hydroplow through lateral movement of organisms and deposit of planktonic forms. Fish entrainment in the hydroplow intake will be avoided by mesh screening of the intake, as described in APM BIO-6.

Mobilization of potential contaminants from laying the cable has the potential to impact marine life. Known areas of sediment contamination are located nearby, with total polycyclic aromatic hydrocarbons (PAHs) well above the probable effects level at the closest Regional Monitoring Program (RMP) site (CB044) and above threshold effects level at sites to the north (CB077) and the south (CB012). Furthermore, the CB044 site was identified as greater than the 99 percentile for the rest of the Bay for mercury concentrations (Stevens, 2011). These RMP sites likely do not represent limited areas, since higher than normal concentrations for polychlorinated biphenyls (PCBs) and PAHs are seen in the Bay south from the proposed cable route (San Francisco Estuary Institute [SFEI], 2009). The coastline along the central waterfront is known to be a hotspot for PCBs as well, with the likely sources coming from freshwater input in the vicinity of the cable route (for example, Mission Creek, urban runoff). Mobilization and presence of contaminants is addressed more fully in Section 3.9, Hydrology and Water Quality.

Operation and maintenance for the proposed project will not change the existing O&M activities associated with Embarcadero Substation and Potrero Switchyard. O&M of the transmission cable itself will entail some less-than-significant impacts, as discussed below. Regular maintenance activities will not be required for the buried cable, aside from periodic vault inspections and automated monitoring via computer. The impacts from any potential repair activities, in the event the cable is damaged, would be similar to those of the original installation but on a much smaller, more localized scale.

The following discussion evaluates potential project construction and O&M impacts on biological resources against the CEQA Checklist significance criteria.

a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? ***Less than significant impact.***

Habitat for 25 special-status marine species occurs within the proposed submarine route. Sixteen managed fish species under the Magnuson-Stevens Act, as well as green sturgeon, Central California Coast Coho salmon, Chinook salmon, Central California Coast steelhead trout, Pacific harbor seal, California sea lion, harbor porpoise, longfin smelt, and/or Pacific herring, may occur along the proposed submarine route. The proposed submarine route provides potential foraging habitat for all of these species and potential spawning habitat for Pacific herring;

the project is outside the migratory corridor for species such as salmon and green sturgeon. With the implementation of APMs BIO-1 through BIO-7, potential impacts will be less than significant.

Construction Impacts

Temporary construction-related impacts (such as elevated noise, human activity, increased turbidity, and ground vibrations) may have a limited impact on wildlife use of the area. It is very unlikely that a direct take of a special-status species through habitat loss or modification will occur. The anticipated noise levels from this work are below thresholds identified to affect marine life, which typically are associated with construction where pile driving is used (NMFS, 2011); no pile driving is proposed as part of this project. The anticipated localized temporary increase in turbidity levels in the marine environment is also low. The area of impact is quite small relative to the surrounding Bay waters – 13,200 square feet versus 400 square miles of Bay. The special-status marine species that have potential to occur along the proposed submarine route are all mobile fish and marine mammals that can avoid disturbances and move to undisturbed areas with ease. The marine cable installation methods, including HDD and use of the hydroplow, will create very limited and localized disturbances. There is extremely low risk of direct mortality through entrainment. The disturbance is expected to result in minor and short-term impacts and therefore will be less than significant.

No pile driving, which could result in an activity noise level expected to rise above 183 decibels in the marine environment, is planned for the project, and therefore the project will have no hydro-acoustic impacts to fish or marine mammals. Should this change, PG&E would be required to develop and implement a sound attenuation and monitoring plan that would be submitted to NMFS and CDFG for approval prior to the commencement of any necessary pile-driving activities.

In the Bay, ship captains and pilots are responsible for ensuring no harassment of marine mammals. Under NMFS regulations, the operator of the vessel could be cited and fined for harassment of any kind to marine mammals under the Marine Mammal Protection Act. According to NMFS' analysis in the America's Cup Environmental Assessment for Incidental Harassment Authorization (NMFS, 2012b) regarding boat traffic, marine mammals avoid boat traffic, and there are no records, despite monitoring, of any collisions occurring from this type of boat traffic. No impacts to marine mammals would be expected.

Given the generally urbanized terrestrial habitat, the mobility of all the sensitive marine wildlife, the preconstruction surveys, worker training, and other measures included in the APMs, construction impacts to special-status species are expected to be less than significant.

Operational Impacts

As noted above, in the event the cable sustains damage from a boat anchor, fishing activities, etc., the impacts from any potential repair activities would be similar to those of the original installation but on a much smaller, more localized scale. The damaged section would be excavated and removed, and a replacement piece of cable would be spliced in its place. Such impacts would be considered adverse but less than significant.

b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? ***No impact.***

No riparian habitat or sensitive natural community types are present in the proposed project area. Eelgrass beds are not present along the proposed submarine cable route, as described above. No impacts to riparian or sensitive natural communities will occur.

c) Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? ***No impact.***

No removal, filling, or other hydrologic alteration of wetlands will occur since no wetlands are present in the project area. Work in the San Francisco Bay will require Section a 404 NWP with the USACE and Section 401 water quality certification with the RWQCB.

d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? ***Less than significant impact.***

Fish, crustaceans, and marine mammals may be temporarily displaced in the immediate vicinity of the hydroplow by the equipment. The temporary and localized displacement of fish is expected to be limited to bottom-dwelling species in the immediate path of the plow and at the HDD entrance. Species that primarily inhabit the middle to upper water column will have a much smaller area of impact as the cable passes through and are expected to continue to use the water column while potentially avoiding the small area around the active cable installation. With the implementation of APMs BIO-1 through BIO-4, potential impacts to marine wildlife movement will be less than significant.

As the hydroplow moves through an area, it will potentially result in the loss or temporary displacement of a small area of benthic organism population. Following the boring and installation of the cables, the deposition of fine sand-mud sediments (by the natural sedimentation process), comparable to pre-project conditions, would begin almost immediately, and the benthic community inhabiting those sediments would be expected to quickly recover to pre-project composition and abundances (Newell et al., 1998). The EIR for the Trans Bay Cable (City of Pittsburg, 2006), which at 53 miles was 20 times the length of the proposed project, found that a very small area of the Central Bay was affected (less than 0.001 percent of similar habitat). Given the relatively small habitat area affected by the proposed project and the temporary nature of the disturbance for benthic species, the potential loss of seafloor habitat from the hydroplow activity will be less than significant.

No migratory corridors or other wildlife connectivity areas occur within the proposed project area, other than that offered by the Bay itself; no major migratory routes appear to be in this area per discussion above. The nearest marine mammal haul-out site is on the far side of Treasure Island and would not be affected by this project.

Finally, the implementation of APMs BIO-1 through BIO-4 will reduce temporary construction-related impacts to wildlife foraging and nesting associated with elevated noise, human activity, ground vibrations, or other disturbance to a less than significant level.

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? **No impact.**

Given the minor amount of area affected and temporary nature of any effects from the hydroplow and HDD in the water, the project design is[compatible with the San Francisco General Plan's relevant goals addressing habitat protection and coordination with public and private sectors to protect biological resources]. With the implementation of APMs BIO-1 through BIO-7, the project will not conflict with biology-related goals or policies of the San Francisco General Plan, so no impact will occur.

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? **No impact.**

There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans, or other approved conservation plans in the proposed project area, so no impact would occur.

3.4.5 References

American Cetacean Society. 2012. "They're Back! — The Harbor Porpoises of San Francisco Bay." Presentation announcement. Online: http://acs-sfbay.org/ai1ec_event/golden-gate-cetacean-research-organization-presents/?instance_id=. Accessed June 2012.

Bartling, R. 2006. *Pacific Herring – Status of the Fisheries Report*. Prepared for the California Department of Fish and Game. December.

Bohorquez, A.S. 2002. *Pupping phenology and haul out patterns of harbor seals (Phoca vitulina richardii) in San Francisco, California*. (Unpublished master's thesis). San Francisco State University, California. Online: http://www.mmc.gov/drakes_estero/pdfs/bohorquez_msthesis_02.pdf.

California Department of Fish and Game (CDFG). 2009. *A Status Review of the Longfin Smelt* (Spirinchus thaleichthys) *in California*. Report to the Fish and Game Commission.

California Department of Fish and Game (CDFG). 2011. *Special Animals (898 taxa).* Biogeographic Data Branch. Online: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf. California Natural Diversity Database. January. Accessed June 2012.

California Department of Fish and Game (CDFG). 2012a. "Fish Distribution Map" Web site. Online: http://www.dfg.ca.gov/delta/data/BayStudy/CPUE_Map.asp#GraphImage. Accessed July 2012.

California Department of Fish and Game (CDFG). 2012b. *California Natural Diversity Database*. RareFind3, Version 3.1.1 (August 2012 update). Biogeographic Data Branch, Sacramento, CA.

California Native Plant Society (CNPS). 2011. *Inventory of Rare and Endangered Plants of California*. Online edition, v7-06c. Sacramento, CA. Accessed December 2011.

California Department of Transportation (Caltrans). 2006. *San Francisco – Oakland Bay Bridge East Span Seismic Safety Project: Marine Mammal and Acoustic Monitoring for the Marine Foundations at Piers E2 and T1*. Online: http://www.biomitigation.org/reports/files/ Marine_Mammal_Piers_E2-T1_Report_0_17b1.pdf. Accessed July 2012.

City of Pittsburg. 2006a. *Draft Environmental Impact Report for the Proposed Trans Bay Cable Project.* Prepared by URS Corporation. Online: www.ci.pittsburg.ca.us/pittsburg/pdf/tbc/index.htm. Accessed July 2012.

City of Pittsburg. 2006b. *Final Environmental Impact Report for the Proposed Trans Bay Cable Project.* Prepared by URS Corporation. Online: http://www.ci.pittsburg.ca.us/pittsburg/pdf/tbc_feir/urs%20tbc%20feir/index.html. Accessed July, September, October 2012.

Grigg, E. K., A.P. Klimley, S.G. Allen, D.E. Green, D.L. Elliott-Fisk, and H. Markowitz. 2009. "Spatial and seasonal relationships between Pacific harbor seal (*Phoca vitulina richardii*) and their prey, at multiple scales." *Fish Bulletin* 107, pp 359-372.

Heublein, J.C., J.T. Kelly, C.E. Crocker, A.P Klimley, and S.T Lindley. 2009. "Migration of green sturgeon, *Acipenser medirostris*, in the Sacramento River." *Environmental Biology of Fishes* 84(3): pp. 245-258.

Leidy, Robert A., Gordon Becker, and Brett N. Harvey. 2005. "Historical Status of Coho Salmon in Streams of the Urbanized San Francisco Estuary, California." *California Fish and Game* 91(4): 219-254.

Leitritz, E. and R.C. Lewis. 1980. *Trout and Salmon Culture (Hatchery Methods*). University of California, Oakland.

McEwan, D.R. 2001. "Central Valley steelhead." In Brown R.L., editor, *Fish Bulletin* 179, pp 1-43. Sacramento, CA: California Department of Fish and Game.

Merkel and Associates, Inc. 2004. *Baywide Eelgrass Inventory of San Francisco Bay: Pre-survey Screening Model and Eelgrass Survey Report*. Report to California Department of Transportation.

Merkel and Associates, Inc. 2010. *San Francisco Bay Eelgrass Inventory October–November 2009*. Report to California Department of Transportation and National Marine Fisheries Service. 12 pp.

Moyle, P. B. 2002. *Inland Fishes of California.* University of California Press, Berkeley, California.

Moyle, P.B., R.M. Yoshiyama, J.E. Williams, and E.D. Wikramanayake. 1995. *Fish Species of Special Concern of California.* Second Edition. University of California, Davis, Department of Wildlife and Fisheries Biology. Prepared for the California Department of Fish and Game, Rancho Cordova.

National Marine Fisheries Service (NMFS). 2004. *Essential Fish Habitat Consultation Guidance*. 80 pp.

National Marine Fisheries Service (NMFS). 2005. *Green Sturgeon (*Accipenser medirostris*) Status Review Update, Official Memorandum*.

National Marine Fisheries Service (NMFS). 2007a. *Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay*.

National Marine Fisheries Service (NMFS). 2007b. *Federal Recovery Outline for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead, Official Memorandum*.

National Marine Fisheries Service (NMFS). 2007c. California sea lion (*Zalophus californianus californianus)*: U.S. stock. Marine Mammal Stock Assessment Report. Online: http://www.nmfs.noaa.gov/pr/pdfs/sars/po2007slca.pdf. Accessed July, 2012.

National Marine Fisheries Service (NMFS). 2011. "Small Takes of Marine Mammals Incidental to Specified Activities; Pier 36/Brannan Street Wharf Project in the San Francisco Bay, CA." A Notice by the National Oceanic and Atmospheric Administration of 10/26/2011. Online: https://www.federalregister.gov/articles/2011/10/26/2011-27739/small-takes-of-marine-mammals-incidental-to-specified-activities-pier-36brannan-street-wharf-project.

National Marine Fisheries Service (NMFS). 2012a. "Marine Mammals" Web site. Online: http://www.nmfs.noaa.gov/pr/species/mammals/. Accessed June, July, August, November 2012.

National Marine Fisheries Service (NMFS). 2012b. E*nvironmental Assessment for Issuance of an Incidental Harassment Authorization to America's Cup Event Authority and Port of San Francisco to Take Marine Mammals by Harassment Incidental to Construction and Race Event Activities for the 34th America's Cup in San Francisco Bay, California.* Online: www.nmfs.noaa.gov/pr/pdfs/permits/americascup_ea.pdf.

Newell, R.C. L.J. Seiderer, and D.R. Hitchock. 1998. "The impacts of dredging works in coastal waters: a review of the sensitivity to disturbance and subsequent recovery of biological resources on the sea bed." *Oceanogr. Mar. Biol. Ann. Rev*. 36:127-178.

Perlman, D. 2010. "Porpoises return to SF Bay – scientists study why." *SF Gate*. Online: http://www.sfgate.com/science/article/Porpoises-return-to-SF-Bay-scientists-study-why-3167006.php. November 8, 2010.

San Francisco Estuary Institute (SFEI). 2009. "Regional Monitoring Program" Web site. Online: http://www.sfei.org/rmp/. Accessed January, June 2012.

San Francisco Bay Area Wetlands Ecosystem Goals Project. 1999. *Baylands Ecosystem Habitat Goals*: *A Report of Habitat Recommendations*. Online: http://www.sfei.org/sites/default/files/sfbaygoals031799.pdf. U.S. Environmental Protection Agency, San Francisco, CA/S.F. Bay Regional Water Quality Control Board, Oakland, CA. Accessed June 2012.

San Francisco Bay Conservation and Development Commission (BCDC). 2011. *San Francisco Bay Plan*. Online: http://www.bcdc.ca.gov/laws_plans/plans/sfbay_plan.shtml. Initially adopted in 1968; last updated October 2011.

San Francisco Planning Department. 2011. *The 34th America's Cup and James R. Herman Cruise Terminal and Northeast Wharf Plaza Draft Environmental Impact Report*. July 11. Online: http://www.sfplanning.org/index.aspx?page=2719&recordid=45&returnURL=%2Findex.asp. Accessed in June, July, August 2012.

San Francisco Planning Department. 2012. *City and County of San Francisco General Plan*. Amended by Resolution No.14149 adopted on 6-27-96. Online: http://www.sf-planning.org/ftp/general_plan/index.htm. Accessed on July 20.

State Coastal Conservancy (SCC). 2012. Subtidal habitat maps. Online: http://sfbaysubtidal.org/map_portal/Intro.html. Accessed July 8, 23, and 27, 2012.

State Coastal Conservancy (SCC). 2010. *San Francisco Bay Subtidal Habitat Goals Project, Conservation Planning for the Submerged Areas of the Bay, 50-year Conservation Plan*.

Shirvell, C.S. 1990. Role of instream rootwads as juvenile coho salmon (*Oncorhynchus kisutch*) and steelhead trout (*O. mykiss*) cover habitat under varying stream flows. *Canadian Journal of Fisheries and Aquatic Sciences:* 47:852-860.

Stevens, Don L. 2011. *Recommended Methods for Outlier Detection and Calculations of Tolerance Intervals and Percentiles- Application to RMP data for Mercury-, PCBs- and PAH-contaminated Sediments*. Prepared for Regional Monitoring Program for Water Quality in San Francisco Bay, Oakland CA. May.

U.S. Army Corps of Engineers (USACE). 2011. *Pier 36 / Brannan St. Wharf San Francisco, San Francisco County, California. Incidental Harassment Permit Application.* 26 pp.

U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA). 2011. Programmatic EFH Conservation Measures for the LTMS Program Agreed-upon by USACE, USEPA, and NMFS.

U.S. Army Corps of Engineers (USACE), U.S. Environmental Protection Agency (USEPA), San Francisco Bay Conservation and Development Commission (BCDC) and San Francisco Bay Regional Water Quality Control Board (RWQCB). 2001. *Long-term management strategy for the placement of dredged material in San Francisco Bay Region.* Prepared for LTMS Management Committee.

U.S. Environmental Protection Agency (USEPA), San Francisco Bay Regional Water Quality Control Board (RWQCB), and San Francisco Bay Conservation and Development Commission (BCDC). 1996. *Long-term Management Strategy (LTMS) for the Placement of Dredged Material in the San Francisco Bay Region. Draft. Policy Environmental Impact Statement/Programmatic Environmental Impact Report.* Volume 1. Prepared for LTMS Management Committee.

U. S. Fish and Wildlife Service (USFWS). 2011. *Critical Habitat Portal*. Online: http://criticalhabitat.fws.gov/. Accessed December 2011.

U. S. Fish and Wildlife Service (USFWS). 2012. *Endangered and Threatened Wildlife and Plants; 12-month Finding on a Petition to List the San Francisco Bay-Delta Population of the Longfin Smelt as Endangered or Threatened*, 50 CFR Part 17.

3.5 Cultural and Paleontological Resources

3.5.1 Introduction

The proposed project's potential effects on paleontological and cultural resources were evaluated to determine their level of significance as provided under the CEQA Guidelines and Section 106 of the National Historic Preservation Act (NHPA) and implementing regulations found in 36 Code of Federal Regulations (CFR) 800.

Paleontological resources are fossils (the remains of prehistoric plants and animals) that are important scientific and educational resources because of their use in (1) documenting the presence and evolutionary history of particular groups of extinct and extant organisms, (2) reconstructing the environments in which these organisms lived, and/or (3) determining the relative ages of the strata in which they occur and the geologic events that resulted in the deposition of the sediments that formed these strata. Standards of practice (e.g., Society of Vertebrate Paleontology [SVP], 1995; BLM, 2008) developed to comply with CEQA as well as with federal statutes incorporate the concept of Paleontological Sensitivity as an index of whether significant impact to fossil resources is likely to occur. Paleontological sensitivity is based on the relative abundance of fossils in an affected stratigraphic unit (affecting the probability of encounter *and* their relative "uniqueness"), and the likely scientific significance of those fossils independent of whether they are rare or common. Every paleontological site is a "unique" (see Table 3.5-1) paleontological site, and the utilization of these sensitivity criteria bridges the gap between that regulatory indeterminacy and practical application by recognizing the dual roles of relative abundance and scientific importance of fossils in determining impact probability and impact significance (SVP, 1995; BLM, 2008).

TABLE 3.5-1
CEQA Checklist for Cultural and Paleontological Resources
Embarcadero-Potrero 230 kV Transmission Project

V. CULTURAL RESOURCES **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less-than-Significant Impact**	**No Impact**
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☑	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☑	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☑	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☑

In the case of this project, while a paleontologically sensitive geological unit will be affected by horizontal directional drilling (HDD), the nature of the unit potentially affected and relatively small volume of sediment impacted lead to the conclusion that the probability of affecting scientifically significant fossils is low; therefore, impacts will be less than significant.

Cultural resources are resources that are human in origin. To determine potential impacts to cultural resources, historical and archival research, Native American consultation, an assessment of the sensitivity for buried archaeological sites, and archaeological and architectural surveys of the work areas were performed. Archaeological sensitivity is defined as the probability of encountering significant prehistoric or historical-era deposits (e.g., artifacts, features, or anthropomorphic soils). These archaeological deposits may be deeply buried or may be found on or near the surface. The majority of the proposed transmission line route has low sensitivity for archaeological resources. Embarcadero Substation has moderate sensitivity for prehistoric archaeological

sites and high sensitivity for historical archaeology. Potrero Switchyard, including the proposed GenOn site, is of low sensitivity for prehistoric archaeology and moderate to high sensitivity for historical archaeology.

Potential impacts to cultural and paleontological resources are listed in Table 3.5-1. As discussed below, project impacts will be less than significant with implementation of the Applicant-Proposed Measures described in Section 3.5.3.2.

3.5.2 Regulatory Background and Methodology

3.5.2.1 Regulatory Background

Paleontological resources are non-renewable scientific resources and are protected by several federal and state statutes, most notably by *Subtitle D Paleontological Resources Preservation, Title 6* of the *Omnibus Public Land Management Act of 2009*, the 1906 Federal Antiquities Act, and State of California's environmental regulations (CEQA, Section 15064.5). Professional standards for assessment and mitigation of adverse impacts on paleontological resources have been established by the SVP (1995) and the BLM (2008) and are discussed further below.

Federal and state laws calling for the preservation of cultural and historic resources include the NHPA, the CFR, CEQA, the California Public Health and Safety Code (HSC), and the California Public Resources Code. Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary land-use regulations. However, local regulations are noted below for informational purposes.

Federal or Federal Delegated

Cultural Resources

The National Historic Preservation Act (NHPA)

The National Historic Preservation Act of 1966, as amended, established the federal government's policy on historic preservation, as well as the national historic preservation program through which that policy is implemented. The NHPA created a federal system for identifying and registering "historic properties," established a federal-state partnership to promote the preservation of such properties, and gave federal agencies responsibility for considering such properties when planning their actions.

Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on historic properties and affords the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Federal agencies fulfill their Section 106 obligations by following its implementing regulations, found in 36 CFR Part 800. These regulations define a historic property as any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP) (36 CFR 800.16). Eligibility for the NRHP is evaluated against criteria set forth in 36 CFR 60.4, and in light of integrity considerations developed by the National Park Service (NPS).

Section 106 of the NRHP also defines what would constitute a significant impact to a resource, called an Adverse Effect by the federal law. According to 36 CFR 800.16(i) an "effect" is an alteration to the characteristics of a historic property that qualify the property for inclusion on the NRHP. There are two principal classes of Section 106 projects with respect to historic properties. These are:

- "No historic properties affected," where there is either no historic property within the Area of Potential Effects (APE), or no effect to historic properties that are present; and
- "Historic properties affected," where there are properties within the APE that are going to be affected by the project.

If it has been determined that a project will have effects on a historic property, then the nature of the effects must be considered. The determination made may be that there is "*no adverse effect*," meaning that any project effects to the property are either temporary, neutral, or perhaps beneficial. Alternatively the determination may be that the project has an "*adverse effect*." Section 36 CFR 800.5 lists seven examples of adverse effects:

- Physical destruction of or damage to all or part of the property;

- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access that is not consistent with the Secretary of the Interior's *Standards for the Treatment of Historic Properties* and applicable guidelines;
- Removal of a property from its historic location;
- Change in the character of a property's use or physical features within the property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance; and
- Transfer, lease or sale of property out of Federal ownership and control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

In all cases, adverse project effects either directly or indirectly diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association or, in the case of a change in ownership, may expose the property to such effects at a later time.

Paleontological Resources

Federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (PL 59-209; 16 United States Code 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands. In addition, the National Environmental Policy Act of 1969 (United States Code, section 4321 et seq.; 40 CFR section 1502.25), as amended and where applicable, requires analysis of potential environmental impacts to important historic, cultural, and natural aspects of our national heritage. The *Omnibus Public Land Management Act of 2009* (H.R. 146; OPLMA), Title 6 Subtitle D *Paleontological Resources Preservation*, requires the secretaries of the Department of the Interior (exclusive of Indian trust lands) and the Department of Agriculture (where U.S. Forest System lands are concerned) to "…manage and protect paleontological resources on federal land using scientific principles and expertise…(and) develop appropriate plans for inventory, monitoring, and the scientific and educational use of paleontological resources…." The OPLMA further describes the requirements for permitting collection on federal lands, stipulations regarding the use of paleontological resources in education, continued federal ownership of recovered paleontological resources, and standards for acceptable repositories of collected specimens. It also provides for criminal and civil penalties for unauthorized removal of paleontological resources from federal land, and rewards for reporting the theft of fossils.

Federal protection for paleontological resources would apply to the project only if any construction or other related project impacts occur on federally owned or managed lands, or if a federal entitlement was required. No federal lands are crossed by the Embarcadero-Potrero project.

State or State Delegated

Cultural Resources

CEQA Section 5024

CEQA Section 5024 mandates that the potential for significant impacts to historical resources be evaluated during the project planning stage. Guidelines (as amended) for determining significant impacts are provided in Section 15064.5. CEQA defines an "historical resource" as any building, structure, object, or archaeological site that is listed in or eligible for listing in the California Register of Historical Resources (CRHR). Properties that are listed in or are eligible for listing in the NRHP or are California Historical Landmarks (CHLs), Points of Historical Interest, are listed on local registers of historical resources, or are identified as unique archaeological sites, also are considered to be significant for the purposes of CEQA.

CEQA Guidelines

Section 15064.5(a)(3) of the CEQA Guidelines (as amended) states that a resource shall be considered historically significant by a lead agency if it meets criteria for listing on the CRHR (Public Resources Code [PRC] 5024.1; Title 14 CCR, Section 4852).

The CRHR sets forth four criteria for evaluating the significance of a cultural property. These criteria closely parallel the NRHP with an emphasis on California's past. The property must satisfy one or more of the following:

1. It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. It is associated with the lives of persons important in our past;
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. It has yielded, or may be likely to yield, information important in prehistory or history.

In addition, cultural properties must also possess integrity as defined in PRC 5024.1 and Title 14 CFR, Section 4852(c).

CEQA Section 5020.1 defines a substantial adverse change as demolition, destruction, relocation or alteration that would impair historical significance. Section 21084.1 states that this change in historical significance is a significant effect on the environment. CEQA Guidelines 15126.4(b)(3) requires public agencies, where feasible, to avoid damaging effects on any historical resource. Preservation in place may include avoiding a resource, incorporating sites within open space, covering sites with fill, or deeding sites into a permanent easement (14 CCR 15126.4(b)(3)). 14 CCR 15126.4(b)(1) outlines measures to reduce impacts to buildings and structures, including following Secretary of Interior Standards and Guidelines for the Treatment of Historic Properties for maintenance, repair, restoration, preservation, conservation or reconstruction of buildings. Demolition, however, is considered a significant impact.

California Health and Safety Code

According to Section 7050.5 of the HSC, in the event human remains are discovered during excavation, work must stop immediately and the county coroner must be contacted. If the remains are determined by the coroner to be Native American in origin, the coroner is responsible for contacting the Native American Heritage Commission (NAHC) within 24 hours. Sections 5097.94 and 5097.98 of the California PRC require consultation with the NAHC, protection of Native American remains, and notification of most likely descendants. Senate Bill (SB) 447 (Chapter 404, Statutes of 1987) also protects Native American remains or associated grave goods.

Paleontological Resources

One of the significance criteria questions to be answered per the CEQA Environmental Checklist (Section 15023, Appendix G, Section V, part c) is: "c) Would the project directly or indirectly destroy a unique paleontological resource or site…?"(Table 3.5-1). Unfortunately, CEQA and its implementing regulations do not define a "unique paleontological resource or site" and, in a literal sense, every paleontological site is unique. In order to better address what would constitute significant impact to paleontological resources, Standards of Practice were developed that include ranking systems relating scientific importance of the fossils to the significance or relative severity of impact. These are discussed below in Section 3.5.2.2.2.

Other state requirements for paleontological resource management are in PRC Chapter 1.7, Section 5097.5/5097.9 (Stats. 1965, c. 1136, p. 2792), entitled Archaeological, Paleontological, and Historical Sites. This statute defines any unauthorized disturbance or removal of a fossil site or remains on public land as a misdemeanor and specifies that state agencies may undertake surveys, excavations, or other operations as necessary on state lands to preserve or record paleontological resources.

Local

As noted above, because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary land-use regulations. The following analysis of local regulations relating to cultural resources is provided for informational purposes and to assist with CEQA review.

San Francisco Planning Commission Articles 10 and 11. San Francisco Planning Commission Articles 10 and 11 establish listings of important City Landmarks, Historic Districts, and Conservation Districts. City Landmarks include buildings, landscape features, and sites. City Historic Districts are comprised of thematically related significant resources. City of San Francisco Conservation Districts are groupings of architecturally distinctive historical-era structures in the downtown area (San Francisco Planning Department, 2012).

San Francisco Preservation Bulletins. San Francisco Preservation Bulletins No. 9 and 10 list 230 City Landmarks, 11 City Historic Districts and 6 City Conservation Districts. In addition, the City and County of San Francisco recognize approximately 30 historic districts which are listed on the NRHP, the CRHR, and National Historic Landmarks. San Francisco Preservation Bulletins No. 1 though 21 outline the process for submitting, reviewing and approving new landmarks and districts, and also provide legal compliance guidelines with respect to cultural resources (San Francisco Planning Department, 2012).

The current general plan for City and County of San Francisco contains no specific requirements, regulations, goals, or objectives designed to mitigate the negative impacts of development on paleontological resources.

3.5.2.2 Methodology

Cultural Resources

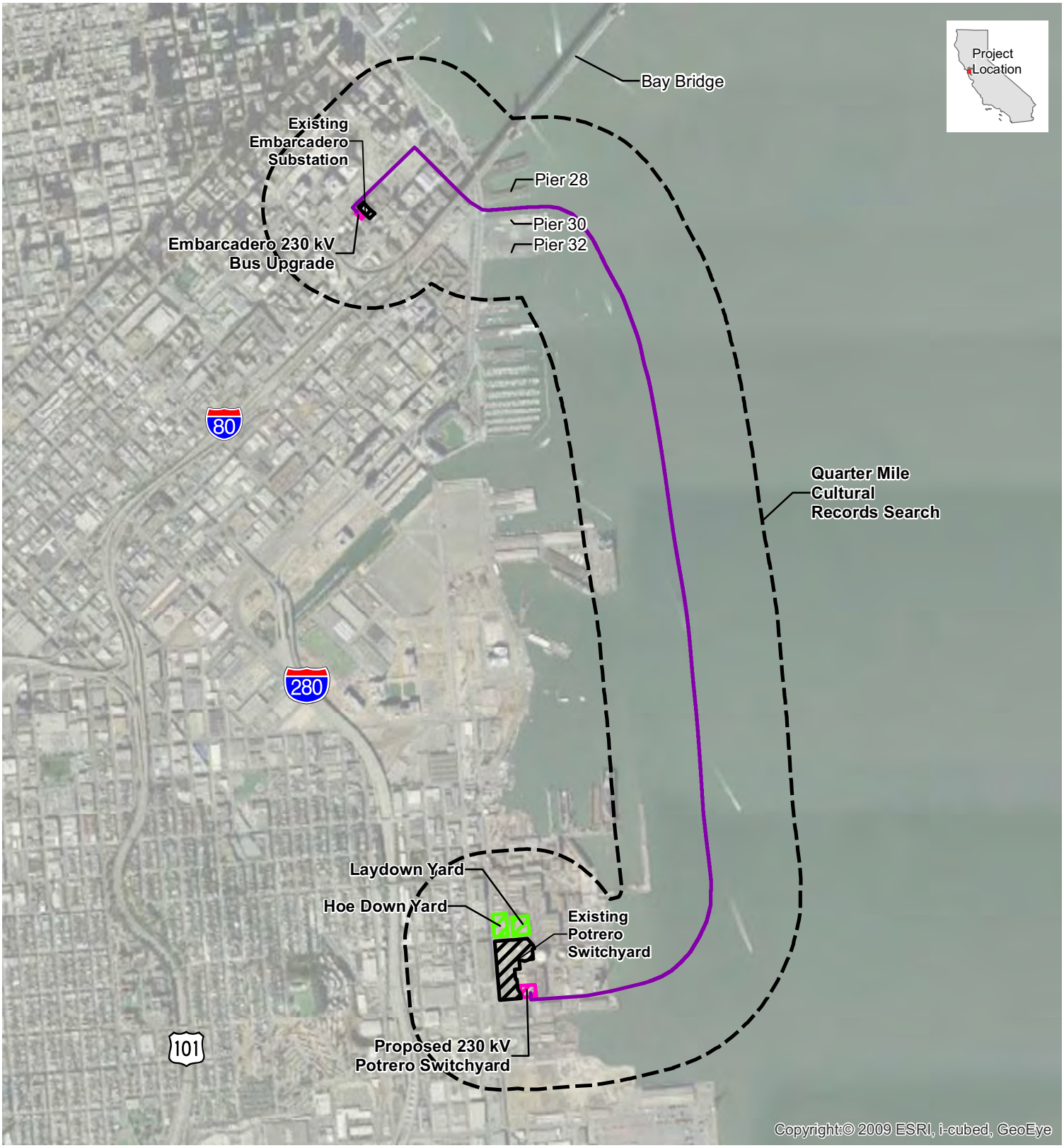
Existing Information Review

A records search was performed using the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) on April 20, 2012. The record search conducted for the proposed route centered on the alignment with one-quarter mile on either side (Figure 3.5-1, Cultural Records Search). The records search included a review of base maps and resource records on file at the NWIC, as well as California Office of Historic Preservation (OHP) listings of significant resources. The OHP listings reviewed at the NWIC included the NRHP, the CRHR, CHLs, the California Inventory of Historic Resources, and the California Points of Historical Interest. The record search also included a review of historical county maps, United States Geological Survey (USGS) topographic maps and United States General Land Office (GLO) maps. In addition to the NWIC records, information was gathered from the City and County of San Francisco Planning Department, the San Francisco Maritime Museum archives, Sonoma State University, the California State Library and various on-line sources.

A search of Sacred Lands Files from the Native American Heritage Commission was requested on June 27, 2012 and again on July 6, 2012. In its response, the NAHC noted that a search of the Sacred Lands Files failed to indicate the presence of Native American cultural resources in the immediate project area, and provided a list of recommended contacts who may have additional information concerning archaeological sites or traditional cultural properties near the project area. PG&E sent requests for information to these eight additional contacts and made follow-up phone calls. Copies of Native American correspondence can be found in Appendix D.

Sensitivity Model

The potential for buried archaeological sites is a practical problem for resource managers who must make a reasonable effort to identify archaeological deposits in a three-dimensional project area, ensuring that potentially important resources are not affected by project activities. Since the project is located in an urban setting, surface survey has little likelihood of identifying archaeological sites. Nor would surface survey identify sites that have been buried by natural deposition or construction fill. The following approach was used to address this issue.



Proposed Transmission Line
Substation/Switchyard
Hoe Down/Laydown Yard
Quarter Mile Cultural Records Search

N
0 1,000 2,000 Feet
Scale: 1:26,000

FIGURE 3.5-1
Cultural Records Search
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

Prehistoric Sites

Geoarchaeologists from Far Western Anthropological Research Group have developed a model of buried-site sensitivity for much of California (Meyer, 2011; Meyer and Rosenthal, 2007 and 2008; Meyer et al., 2010 and 2011; Rosenthal and Meyer, 2004). This model is based on an analysis of the relationship between late Quaternary landscape evolution and the structure and visibility of the archaeological record. Understanding the age of different landforms is a fundamental step in discerning where the archaeological record is likely to be buried, and where cultural remains deposited over the entire span of human occupation may be preserved on or just below the modern ground surface.

The age of surface landforms can be mapped using soils surveys developed by the Natural Resources Conservation Service. By correlating radiocarbon-dating information with characteristics of soil development and landform superposition, it is possible to produce a detailed map of latest Pleistocene, Holocene, and historical-era landforms in a given area. Once established, landform age is combined with environmental characteristics thought to be attractive for human occupation (e.g., slope and distance to water) to identify those portions of the modern landscape most likely to yield archaeological sites in both near-surface and buried contexts.

The potential for buried prehistoric sites to occur in the project area was determined using landform ages, the age and distribution of known archaeological deposits, and the proximity to natural streams and the prehistoric shoreline of San Francisco Bay (i.e., distance to water). This type of sensitivity assessment has proven effective in many contexts throughout California.

Historical Sites

Sensitivity for historical-era buried resources was characterized by determining the location, age and depth of historical fill, considering the location of known below-ground historical resources and researching the patterns of historical development and redevelopment in the area. This process involved extensive research and examination of historical maps and documents relating to the history of development and large-scale land modification in the project vicinity. Sensitivity determinations also take into account the locations of known historical archaeological features, locations of historical buildings, and locations of historical piers and docks. Abandoned ships are often associated with the historical piers, particularly those piers abandoned before 1854 (Sonoma State University, 1993). Many were converted into stores, then later burned or filled as the city grew. Areas around the old pier locations are considered highly sensitive for deeply buried deposits. In addition, back yards and side lots of private parcels in the area have the highest potential for hollow-filled features such as wells or privies (Praetzellis and Praetzellis, 2009). In general, the streets of the city were laid out early in the city planning process. Work completed by Sonoma State University for the Tar Flat/Rincon Hill Area was used to plot storeship and other sensitive locations for the north end of the project (Sonoma State University, 1993). Geotechnical data from the *Embarcadero To Potrero Za-1 230kv Underground Transmission Project Feasibility Study* (Black & Veatch, 2012) was used to verify depths of fill.

Fieldwork Methods

Intensive pedestrian archaeological and historical architectural surveys of the APE were completed on June 28, 2012. The surveys encompassed the onshore portions of the proposed route as well as substations and focused work areas as depicted on project planning maps. The pedestrian survey of the APE included:

- Approximately 0.7 mile of onshore route along the proposed route alignment
- A windshield survey was conducted for paved and built areas which had no pedestrian access. These areas included:
  - Embarcadero Substation (approximately 2 acres between Folsom and Harrison Streets on the west side of Fremont Street)
  - Potrero Switchyard (approximately 7.5 acres on the north side of 23rd Street)
  - The Gen-On Site (0.85 acre contained within the Potrero Switchyard area)

Archaeological Survey

The archaeological survey for the northern extent of the proposed route encompassed Folsom Street between 1st and Spear Streets, Spear Street from Folsom to the Embarcadero, and across the Embarcadero just south of Pier 28. The southern extent of the onshore portion of the proposed route encompassed 23rd Street from the corner of Illinois Street east to the bay. A pedestrian survey of the northern onshore portions of the proposed route APE was conducted; however, 100 percent of the route has been paved and developed. The southeastern onshore portion of the proposed route was not accessible for pedestrian survey, but the area is visible from the end of 23rd Street and consists entirely of built-over and paved surfaces. Embarcadero Substation and Potrero Switchyard, located at the northern and southern ends of the proposed route, respectively, were also inspected and found to be 100 percent paved or built-over.

Built Environment Survey

The architectural fieldwork included a pedestrian survey of the onshore portions of the proposed route APE and a windshield survey to verify the locations of historical-era built environment resources. All built environment resources along the proposed route APE were documented and photographed. A windshield survey was also conducted for the Gen-On site area and the southeastern extent of the proposed route. Neither area was accessible for pedestrian survey; they were examined and documented with a zoom-lens camera.

Paleontology

Professional Standards

Professional standards play an important role in paleontological resources assessments because, with a few notable exceptions (e.g., BLM, 2008), federal and state agencies are largely mute on how to conduct paleontological resources assessments. As discussed above, while the CEQA checklist asks if the project might affect a unique paleontological site, it provides no guidance on what a "unique" site might be, and every paleontological resource is unique to a greater or lesser extent. In order to better address what would constitute significant impact to paleontological resources, Standards of Practice were developed (SVP, 1995; BLM, 2008) that included ranking systems relating significance or relative severity of impact to the scientific importance of the fossils that might be encountered, and their likely abundance in the affected geological unit. Relative abundance of fossil remains in turn informs on (1) the commonness or "uniqueness" of the remains themselves, and (2) the probability that any will be encountered during excavations.

In particular the SVP, an international organization of professional paleontologists, has established standard guidelines (SVP, 1995) that outline acceptable professional practices in the conduct of paleontological resource assessments. Most practicing paleontologists in the nation adhere to the SVP's guidelines and extend those to address other types of fossils of scientific significance, such as invertebrate fossils and paleobotanical specimens. More recently the BLM's *Informational Memorandum 2008-009* (BLM, 2008) provides updates and elaboration on assigning levels of paleontological sensitivity, and on procedures for paleontological inventory. These standards are relevant to non-federal undertakings as well, and they are widely used by paleontologists because they provide for detailed analysis of paleontological sensitivity. Their application is outlined below in Section 3.5.2.3.

Existing Information Review

Published and available unpublished geological and paleontological literature was reviewed to develop a baseline paleontological resource inventory of the project area, and to assess the potential paleontological productivity of the stratigraphic units that may be affected by the project. Sources included geological maps, paleontological and geological reports, and available electronic databases. A paleontological resources record review was conducted for the project on May 12, 2012 using the online database maintained by the University of California at Berkeley Museum of Paleontology (UCMP).

Paleontological Sensitivity

Standards of practice for paleontological resources assessments include the development of paleontological sensitivity ratings for geological units potentially affected by a project, in order to provide a means by which the

significance of impacts on paleontological resources can be assessed. Paleontological sensitivity is a qualitative assessment of paleontological potential made by a professional paleontologist taking into account the paleontological productivity of the stratigraphic units present based on prior fossil records, the local geology and geomorphology, and any other local factors that may be germane. According to SVP (1995) and BLM (2008) guidelines, sensitivity comprises (1) *the potential for yielding* abundant or significant vertebrate fossils or for yielding a few significant fossils, whether large or small, vertebrate, invertebrate, or paleobotanical remains, and (2) the potential importance *of recovered evidence* for new and significant taxonomic, phylogenetic, paleoecological, or stratigraphic data (italics added for the sake of subsequent discussion). A summary of the sensitivity ratings used in this report is given in Table 3.5-2.

TABLE 3.5-2
Paleontological Sensitivity Ratings Employed
Embarcadero-Potrero 230 kV Transmission Project

Categories of Paleontological Sensitivity	Definition
High	Assigned to geological formations known to contain paleontological resources that include rare, well-preserved, and/or fossil materials important to ongoing paleoclimatic, paleobiological and/or evolutionary studies. They have the potential to produce, or have produced, vertebrate remains that are the particular research focus of many paleontologists and can represent important educational resources.
Moderate	Stratigraphic units that have yielded fossils that are but moderately well preserved, are common elsewhere, and/or that are stratigraphically long-ranging would be assigned a moderate rating. This evaluation also can be applied to strata that have an unproven but strong potential to yield fossil remains based on the stratigraphy and/or geomorphologic setting.
Low	Sediment that is relatively recent, or that represents a high-energy subaerial depositional environment where fossils are unlikely to be preserved. A low abundance of invertebrate fossil remains, or reworked marine shell from other units, can occur but the paleontological sensitivity would remain low due to their lack of potential to serve as significant scientific or educational purposes. This evaluation also can be applied to strata that have been monitored and that have failed to yield scientifically significant fossil remains.
Marginal and Zero	Stratigraphic units with marginal potential include pyroclastic flows and soils that might preserve traces or casts of plants or animals. Most igneous rocks have zero paleontological potential. Other stratigraphic units deposited subaerially in a high energy environment (such as alluvium) also may be assigned a marginal or zero sensitivity rating. Manmade fill is also considered to possess zero paleontological potential.

Source:
Adapted from *Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources B Standard Guidelines* (SVP, 1995) and the U.S. Bureau of Land Management's *Informational Memorandum 2008-009* (BLM, 2008)

3.5.2.3 Existing Setting

Regional Setting

Prehistoric and Archaeological Context

The prehistoric and archaeological context for this project was adapted and abridged from Byrd et al. 2010 and is provided in Appendix D. It includes a brief discussion of the San Francisco Bay Area regional prehistoric sequence, followed by a summary of the archaeological research to date in the northern portion of the San Francisco peninsula.

Geoarchaeological Background

The majority of the study area is located within the historical extent of Mission Bay and areas immediately offshore. Embarcadero Substation, at the north end of the study area, is located at the northern slope of Rincon Hill immediately south of the shores of Yerba Buena Cove; Potrero Switchyard, at the southern end of the project area, is located on Potrero Point to the east of the base of Potrero Hill. Historically, the remainder of the onshore portion of the study area was within a vast dune field that covered much of the northeast San Francisco

peninsula. Dramatic historical-era landscape changes within and near the study area include leveling sand dunes and the placement of thick deposits of artificial fill to reclaim Mission Bay, Yerba Buena Cove, and the surrounding areas for development.

Deeper areas of the Bay, generally those that lie 30 feet (10 meters) or more below sea level, were fully inundated by sea-level rise during the early Holocene more than 7,000 years ago, making them unavailable for subsequent human use and occupation in the Holocene. Additionally, rapid sea-level rise during the early and middle Holocene may have eroded (i.e., truncated) portions this surface along with any associated archaeological deposits. These factors further lower the potential of discovering buried prehistoric archaeological deposits beneath the Bay Mud in this part of project area.

There is a higher potential for buried prehistoric sites within the near-shore zone, where Bay Mud deposits are generally thinner and inundation occurred later in time. However, since the earth disturbances proposed in these zones is relatively small and highly localized, relatively little, if any, of the buried surfaces with the potential for buried prehistoric archaeological deposits (if present) would be impacted by project-related activities.

Recent geoarchaeological research on the northeast San Francisco peninsula has documented at least three periods of dune activity and deposition, interspersed with periods of stability and soil formation during the Late Pleistocene and Holocene. The punctuated nature of dune deposition on the northern peninsula resulted in the burial of several prehistoric archaeology sites. The age and stratigraphic context of these sites indicate that they were buried by Late to Latest Holocene dune activity. Additionally, a 5,000-year-old human skeleton (SFR-28) was found in downtown San Francisco during construction of the Bay Area Rapid Transit (BART) tunnel. These remains were found in buried marsh deposits overlain by bay mud and sand dunes at a depth of approximately 59 feet (18 meters) below the historical ground surface and more than 23 feet (seven meters) below modern sea level (Henn et al., 1972). A buried site was recently discovered along Tehama Street a few blocks west of the project area during Extended Phase 1 geoarchaeological coring (Byrd et al., 2010). A radiocarbon date of 1,035 calibrated years Before Present (cal BP) from marine shell from this site (SFR-151/H) indicates that a period of widespread dune deposition around 1,000 years ago probably buried several sites in this area.

Previous Archaeological Investigations on the Northern San Francisco Peninsula

The first extensive study of the Bay Area's prehistory was a survey of shell mounds and middens by N. C. Nelson (1909), who recorded more than 425 sites along the margins of San Francisco Bay. Additional shell mounds have been recorded in the region by others (e.g., Laston and Mezes, 1858), and Nelson's (1909) original map also has been used to plot and number sequentially additional mounds in the area (e.g., Olmsted and Olmsted, 1982: Map 2).

A series of these shell mounds was excavated early in the twentieth century (e.g., Gifford, 1916; Nelson, 1910b; Schenck, 1926; Uhle, 1907). Very little subsequent work was carried out on the northern peninsula until the enactment of environmental laws and the emergence of cultural resource management in the mid-1970s. Since then a series of prehistoric sites have been investigated, and as of 2010, at least 17 prehistoric sites in the general project vicinity had been subjected to formal archaeological testing or data recovery excavation.

The excavated sites are mainly shell middens (n=14), along with two shell mounds (SFR-6 and -7) and one isolated burial (SFR-28). With the exception of a Middle Holocene date from SFR-28 (a deeply buried isolated skeleton), all of the sites date to the Late Holocene. They include sites from the Early, Middle, and Late period, although Early period occupation is currently only documented on Yerba Buena Island.

Ethnohistoric and Historical Context

The study area falls within the aboriginal territory of the Ohlone, once referred to by the Spanish as Costanos (for "coastal people"). Most of what we know about the Ohlone comes from early Spanish accounts, along with a few twentieth century interviews by anthropologists who gathered information on remembered lifeways (Bean, 1994). Recent interpretations of Ohlone lifeways, sometimes contradictory with earlier studies, are largely based on mission records research done by Milliken (1983, 1995, 2006).

The onshore portion of the study area extends from the historical Rincon Hill neighborhood (near the corner of Fremont and Folsom Streets) south to Potrero Point. This area has been occupied since the earliest days of the California Gold Rush in 1849 and has undergone numerous phases of commercial and residential development. Today, the northern half of the study area, especially along the onshore portion of the proposed route following Spear and Folsom streets, is commercial with limited residential development. Land use in the southern half of the study area, particularly along the onshore portion of the proposed project, is currently characterized by industrial development. Occupation within the southern portion of the study area began early and intensified in the 1860s as a ship-building district mixed with residential elements in the Potrero Point neighborhood. About half of the land along the southern onshore portion of the proposed project is on historical fill.

Detailed summaries of the ethnohistoric and historical contexts for the study area are provided in Appendix D.

Local Setting

Record Search Results

Record search results are summarized below for the proposed route alignment, as well as two substations (Embarcadero Substation, Potrero Switchyard) and the associated proposed work area (GenOn Site). The record search identified 165 cultural resources reports and 253 previously documented resources (primarily historical structures) located within the research corridor (within 1/4 mile of project areas). Tables detailing all resources within the 1/4-mile record search perimeter for each of these areas may be found in Appendix D.

Prehistoric Resources

The records search for areas within 1/4 mile (~1,320 feet) of the proposed route identified one dual-component site (P-38-004326, CA-SFR-151/H), located about 1/8 mile from Embarcadero Substation at the north end of the proposed project. The prehistoric component of the site consist of a buried deposit located 11.5 feet below the ground surface that was carbon dated to between 1,000 and 2,000 years before present (Kaijankoski, 2008).

Historical Archaeology Resources

The records search identified five previously recorded historic sites (including the above dual-component site) and three reported but not formally recorded sites within the records search area. Six of these resources (P-38-104, -120, -4325, -4326, -4884, and the Wirth Site [defined below]) are located within 1/4-mile of the northern overland portion of the project; two (Mirant site and Station A Foundations) are within 1/4-mile of the southern overland portion of the project.

There have been a number of historical archaeological studies in San Francisco beginning in the late 1970s that have occurred in response to proposed development projects, post-Loma Prieta earthquake (1989) construction, road work, or other projects. These studies include detailed parcel histories, development of extensive thematic contexts and research design issues, and discussions of level of underground sensitivity in particular areas (cf. Byrd et al., 2010; Hupman and Chavez, 1997; Pastron and Hattori, 1990; Sonoma State University, 1993). Some studies have led to excavations of all or portions of city blocks, including two sites adjacent to the project (P-38 -120 and -4325) (Byrd et al., 2010:128-129; Hupman and Chavez, 1997; Pastron, 1990; Praetzellis and Praetzellis, 2009; Reed, 1976). Large portions of these sites were subjected to archaeological excavation and data recovery as part of the development projects and have been destroyed. In addition, there are buried historical features including brick foundation walls, other structural remains, and ninetieth-century artifacts located immediately west of the Embarcadero substation. This area was the subject of limited test excavations in the late 1970s but was never formally recorded (Wirth Associates, 1979a and 1979b). For the purposes of the current document, this group of features will be referred to as the Wirth Site.

In recent years the Anthropological Studies Center at Sonoma State University investigated a number of San Francisco-area blocks south of Market Street for the San Francisco-Oakland Bay Bridge West Approach Project (Praetzellis and Praetzellis, 2009). Their study included 14 city blocks from the west anchorage of the bridge between Fremont and Beale streets to the beginning of the SF-80 Bayshore Viaduct between Fourth and Fifth Streets.

In contrast to the north end of the project around Embarcadero Substation, the Potrero Switchyard area has had little archaeological investigation. In 1979 Wirth Associates conducted studies at the Mirant Potrero Power Plant site, placing a series of trenches through the property. The remains of a mid-nineteenth century powder magazine were exposed (URS Corporation, 2006:4.7-3) but no trinomial number was assigned. In 2006 URS Corporation noted that several buildings and structures, including a large tank, had been demolished at Station A, leaving remnant foundations. The foundations were not called out as an archaeological site but were discussed within the context of the extant buildings at the facility (URS Corporation, 2006). No other work has been conducted in this area.

Shipwrecks

The online State Lands Commission (SLC) Shipwreck Database (http://shipwrecks.slc.ca.gov/ShipwrecksDatabase/Shipwrecks_Datapase.asp) lists shipwrecks by county and is based primarily on historical accounts of these incidents. Additional locations are maintained in the San Francisco Maritime Museum archives. There are six named shipwrecks mapped within one-half mile of the project area, listed in the SLC database and primarily located in the Mission Bay and China Basin areas. All the known shipwrecks are over one-quarter mile from the proposed route.

In addition to the recorded shipwrecks, work conducted in city streets by Sonoma State University and others identified a pattern of ships abandoned at piers and docks during the gold rush and later reused as stores. As the City expanded, these "storeships" were abandoned, sometimes burned, and buried in fill. Nearly 50 potential storeship locations have been plotted along the Embarcadero and inland for up to six city blocks. Six have been explored archaeologically and are considered eligible for inclusion in the NRHP and CRHR. The exact locations and conditions of the remaining ships are unknown.

Built Environment

The NWIC search included OHP listings of resources that have been evaluated on a national, state, or local level. Registers checked include the NRHP, CRHR, CHLs and California Points of Historical Interest, San Francisco Historic Landmarks, San Francisco Historic Districts, and San Francisco Conservation Districts. There are a total of 240 built environment resources within one-quarter mile of the project route, Embarcadero Substation, Potrero Switchyard, or the GenOn site that are included in the OHP historic properties data files, federal, state, or local listings (Appendix D). Built environment resources that are adjacent to the onshore portions of the proposed route are discussed below, under Results of Built Environment Studies. Of the 166 resources that have NRHP status codes in the listed historic properties data file, 12 are listed on the NRHP (4 are individually listed and 8 are contributing elements to a NRHP listed district). Eighteen additional properties are listed as "determined eligible" and seven are coded as "appears eligible" for the NRHP (OHP, 2012). All resources that are eligible for or listed on the NRHP are also eligible for or listed on the CRHR. In addition, a plaque commemorating the historic development of Rincon Hill in the 1860s (SHL No. 86) is located within the quarter-mile record search radius for Embarcadero Substation and the northern onshore portion of the project alignment (OHP, 2012).

There are four designated San Francisco Landmarks, two San Francisco Historic Districts, and one San Francisco Conservation District on listings maintained by the San Francisco Planning Commission within the record search area (San Francisco Planning Department, 2012).

Geologic Setting

The general geology of the San Francisco area has been described in some detail by Taliaferro (1951), Schlocker et al. (1958), Schlocker (1974), Helley et al. (1979), Wahrhaftig and Sloan (1989), and Wahrhaftig et al. (1993), among others. The geology in the vicinity of the proposed project facilities has been mapped by Lajoie et al. (1974; 1:62,500 scale) and Schlocker (1958, 1974; 1:24,000 scale). San Francisco Bay fills a north-northwest-trending structural trough in the central Coast Ranges between the San Andreas Fault to the southwest and the Hayward Fault to the northeast. The City of San Francisco is located in the northern portion of the San Francisco Peninsula, which consists of north-northwest oriented ridges comprising the western portion of the Coast Ranges Physiographic Province. The Great Valley Physiographic Province lies to the east of the Berkeley Hills, on the

other side of the Bay, and the Pacific Ocean is to the west. During periodic ice ages sea level is much lower, and therefore during these periods the Bay is a complex of dry valleys with rivers running along their axes.

Rocks and sediments in the general project vicinity can be divided into two distinct domains. The first and by far the oldest is bedrock composed of Mesozoic age (Jurassic and Cretaceous) sediments named the Franciscan Complex. The Franciscan Complex forms the bedrock "basement" throughout the area. Sediments resting unconformably on the Franciscan Complex constitute the second major grouping. These are much younger, unconsolidated to poorly consolidated deposits that are geologically young, ranging in age from Pleistocene to Holocene (the last two million years).

Geologic Units and Paleontological Sensitivity

Geologic mapping by Schlocker (1974) was used to determine the underlying geology for each of the project components. Embarcadero Substation is underlain by artificial fill and sandstone and shale of the Mesozoic Franciscan Complex. Potrero Switchyard is underlain by artificial fill and Mesozoic serpentinite. The submarine portion will be through Holocene deposits of Bay Mud, and the HDD will go through portions of the Pleistocene Colma Formation.

Mesozoic Rocks

Serpentinite. Serpentinite is a metamorphic rock derived from ultramafic igneous rocks or sediments high in manganese and iron and low in silica that have undergone high pressure and low temperature metamorphism. Metamorphic processes generally destroy any fossil material that may have been present in the parent rock; therefore, serpentinite is considered to have no paleontological sensitivity.

Franciscan Complex. The Franciscan Complex consists predominantly of graywacke sandstone interbedded with lesser amounts of dark shale. Outcrops of submarine basalt (greenstone), limestone, chert, and metamorphic blueschist are also contained within the complex.

Fossils from Franciscan Complex rocks are rare, but when found have been important in unraveling the ages, depositional environments, and tectonic history of this continental margin during the Mesozoic. The UCMP database contains two invertebrate fossil localities from the Franciscan Complex within San Francisco County. Schlocker et al. (1958) reported a Cretaceous ammonite found in Franciscan shales in northeastern San Francisco. Schlocker (1974) also referred to fossil plant remains in Franciscan rocks, although usually with such terms as "carbonaceous matter," "lignitic material," "large carbonaceous particles and layers," "large abundant paper-thin flakes of coaly material…," or "carbon having relict plant-cell structures." Fossil gastropods (snails) and pelecypods (clams) have been reported from a locality on Alcatraz Island and elsewhere in the San Francisco area by Stewart (1930), Anderson (1938), and Ghent (1963).

These records notwithstanding, the rocks of the Franciscan Complex are usually assigned low paleontological sensitivity, as they are here, because the fossil material is sparsely distributed and frequently consists of limited, non-abundant invertebrates and unidentifiable plant remains.

Quaternary Sediments

An important aspect of Quaternary sediments is that, where they have not been removed by erosion or development, they consist of unconsolidated sediments draped over and filling in the topographically irregular bedrock surface provided by the rocks discussed above. The marine Bay Mud can be expected to display comparatively little lateral variation in sediment type, while terrestrial facies of the Colma Formation likely may range from colluvial (hillslope and landslide debris) and dune deposits that lack paleontological sensitivity, to pond and bog sediments that can yield important paleontological records, as described below.

Colma Formation. The Colma Formation, formed under shallow marine and subaerial dune and fluvial conditions during the late Pleistocene (between 70,000 and 130,000 years ago) typically consists of weakly-consolidated and friable sand with some sandy silt, clay, and gravel (Schlocker, 1974). Although the UCMP database contains no fossil localities from the Colma Formation within San Francisco County, the literature indicates that the Pleistocene Colma Formation has produced significant marine and terrestrial fossils, particularly within the City of

San Francisco. Rodda and Baghai (1993) reported the remains of mammoth, extinct bison, and ground sloth from the Colma Formation. Schlocker (1974) reported fossil plant remains and a peat layer at the top of the Colma Formation possibly representing "an old soil that developed in or near local marshes or lakes." Marine facies of the Colma Formation have produced marine megafossils, marine and nonmarine diatoms, and sponge spicules (Schlocker, 1974). Savage (1951) listed other vertebrate fossil localities in the San Francisco Bay region to which he assigned an "undifferentiated Pleistocene" age, and some of these may also be referable to the Colma Formation. While some of these records are scientifically significant, as noted above not all facies of the Colma Formation yield paleontological material, and some of that material is not particularly scientifically important in and of itself (e.g., sponge spicules, diatoms). An overall relative paucity of fossils from the Colma Formation may account for the lack of paleontological records attributable to the unit in the UCMP database, which can be expected to offer relatively comprehensive coverage of fossil sites in the Bay Area. Therefore the Colma Formation is assigned moderate paleontological sensitivity.

Bay Mud. Bay Mud consists of water-saturated, estuarine mud underlying the marshlands and tidal mudflats of the San Francisco Bay, and in subtidal areas. Generally composed of soft and silty clays, Bay Mud also typically contains lenses of fine sand and peaty material. Bay Mud deposits were laid down after the post-glacial rise of sea level inundated the San Francisco Bay area approximately 10,000 radiocarbon years ago (Atwater, 1979) and, as such, are Holocene in age. This unit is therefore designated as having low paleontological sensitivity.

Artificial Fill. Artificial fill materials consist of loose to very well-consolidated gravel, sand, silt, clay, rock fragments, organic matter, and man-made debris in various combinations. The thickness of artificial fill materials in San Francisco is variable and may exceed 30 feet in some areas (Schlocker, 1974). Geologic mapping of the project area indicates that much of the project route has underlying artificial-fill materials or native soils that have been otherwise mechanically altered by historical earthwork operations. Artificial-fill materials are primarily found along the shores of the Bay both on the northern and southern ends of the project. Although artificial fill may contain fossils transported from its source, those fossils would be lacking stratigraphic context and provenance and therefore would have only limited scientific and educational value. Therefore, artificial fill possesses little if any paleontological significance.

3.5.2.4 Native American Consultation

PG&E sent requests for information to the list of eight NAHC-recommended contacts who may have additional information concerning archaeological sites or traditional cultural properties near the project area (as described in Section 3.5.2.2). No responses were received. Follow-up phone calls were made on November 7 and December 4, 2012. Of the six individuals who could be reached by phone, two indicated that they knew of sensitive resources in the vicinity and requested additional information about the project before they would provide formal comments; two recommended monitoring during construction; one requested that the legally required procedures be followed in the event of an unanticipated discovery of a prehistoric resource; and one had no comments or concerns. Copies of Native American correspondence can be found in Appendix D.

3.5.2.5 Archaeological Surveys Results

The majority of the project is fully developed and paved and as a result, the surface archaeological survey was limited; no surface evidence of prehistoric or historical-era deposits or features were noted during the archaeological survey.

The GenOn site was inspected visually by looking through the fence and by examining aerial images available on line. One large circular tank foundation and a linear stem wall foundation were identified both from the satellite image and from the visual inspection. These foundations are associated with Station A and are discussed by URS Corporation (2006) in conjunction with the overall built environment for the facility. They are included in the built environment section below.

Archaeological Sensitivity Studies Results

For the purposes of this analysis, the sensitivity analysis for "buried" archaeological sites includes both deeply buried sites and those that may have been located at or near the historical-era ground surface that were either covered or destroyed by development and construction within the project area. Thus, the sensitivity model

described in Section 3.5.2.2.1 takes into account the potential for both deeply buried and near-surface archaeological resources. The historical structures and sensitive areas along the transmission line route are limited to the land areas of the route. The submarine portion of the route is very unlikely to penetrate the thick Bay Mud, or to come into contact with a buried terrestrial surface, which generally lies at elevations of 60 to 80 feet (18.2 to 24.4 meters) below sea level across most of the route. Therefore, the off-shore, submarine portion of the transmission route has a low level of archaeological sensitivity.

The greatest potential for buried prehistoric sites exists within the near-shore zone, where Bay Mud deposits are generally thinner and inundation occurred later in time. However, since the earth disturbances proposed in these zones is relatively small and highly localized, relatively few, if any, buried surfaces with the potential for buried prehistoric archaeological deposits would be impacted by project-related activities (see Appendix D).

Embarcadero Substation is moderately sensitive for prehistoric archaeological remains and highly sensitive for historical-era archaeological deposits. Buried prehistoric sites are known to exist in the vicinity (Byrd et al., 2010), and historical maps indicate that a series of buildings stood on the site beginning in the mid-nineteenth century. One NRHP- and CHRH-eligible building (Klockars Blacksmith Shop) still stands adjacent to the substation.

Potrero Switchyard, including the proposed GenOn site, is of low sensitivity for prehistoric remains and moderate to high sensitivity for historical archaeology. The GenOn site is immediately adjacent to the four buildings contained in Station A, an NRHP- and CHRH-eligible gas manufacturing plant.

Table 3.5-3 provides a summary of site sensitivity in the proposed project areas.

TABLE 3.5-3
Site Sensitivity in the Proposed Project Areas
Embarcadero-Potrero 230 kV Transmission Project

Alternative	Prehistoric Sensitivity/Sites	Historical Sensitivity/Sites	Built Environment Resources
Proposed Route	Low	Low to Moderate	19
Embarcadero Substation	Moderate	High	1
Potrero Switchyard/GenOn Site	Low	Moderate to High	3

Results of Built Environment Studies

There are hundreds of buildings and structures within the study area that are over 50 years of age (see Appendix D). Buildings over 50 years of age that are along the onshore portions of the proposed route (buildings on the streets that the proposed onshore route follows) are categorized in Table 3.5-4 as either in the northern or southern portion of the route, and graphically presented in Appendix D. There are no buildings or structures on the submarine section of the route.

TABLE 3.5-4
Buildings Along or Adjacent to Onshore Portions of the Proposed Route
Embarcadero-Potrero 230 kV Transmission Project

Building/Location	Regulatory Summary	Eligibility
Northern Land Section		
Building 1: 443 Folsom Street/Klockars Blacksmith Shop/SF Historic Landmark No. 149, (P-38-004069) Southwest of Embarcadero Substation.	Historical resource for the purposes of CEQA; a historic property under Section 106 of the National Preservation Act	Considered eligible for listing in the NRHP and CRHR under Criterion A for its association with the manufacturing development of San Francisco (OHP, 2012; Bunse, 2012:2).

TABLE 3.5-4
Buildings Along or Adjacent to Onshore Portions of the Proposed Route
Embarcadero-Potrero 230 kV Transmission Project

Building/Location	Regulatory Summary	Eligibility
Building 2: 353 Folsom Street, O'Donnell Coppersmith Building (P-38-004443)	This building is considered by the City of San Francisco to be a potential historic resource, although it has not been formally evaluated.	Considered potentially eligible for inclusion in the NRHP and CRHR and is considered a historical resource for the purposes of CEQA (San Francisco Planning Department, 2011).
Building 3: 301 Folsom Street/ Coffin-Redington Building (P-38-3063)	This resource is listed on the NRHP and the CRHR (OHP, 2012).	It was evaluated as individually eligible under Criterion C on 3/29/2000 and 7/13/2001 (OHP, 2012). It is considered a historical resource for the purposes of CEQA.
Building 4: 285 Main Street, 150 and 160 Folsom Street/Eucharist Church	The building has not been formally evaluated, but is considered a potentially historic resource by the City of San Francisco (San Francisco Planning Department, 2011).	For the purposes of this project, it is considered potentially eligible for inclusion in the NRHP and CRHR and is considered a historical resource for the purposes of CEQA.
Building 5: 2 Harrison Street (P-38-000120/CA-SFR-115H)	The plant building is San Francisco Historic Landmark number 157. It has not been formally evaluated for eligibility for the CRHR or the NRHP (San Francisco Planning Department, 2012).	For the purposes of this project, it is considered potentially eligible for inclusion in NRHP and CRHR and is considered a historical resource for the purposes of CEQA.
Building 6: 1 Harrison Street (P-38-004438)	The building has not been formally evaluated, but is considered a potentially historic resource by the City of San Francisco (San Francisco Planning Department, 2011).	For the purposes of this project, it is considered potentially eligible for inclusion in NRHP and CRHR and is considered a historical resource for the purposes of CEQA.
Building 7: 100 Harrison and 350 and 360 Spear Street	The building is considered to be potentially historic by the City of San Francisco (San Francisco Planning Department, 2011); however, it has been significantly modified and today appears to be a completely modern structure.	It is not considered to be a historic property under Section 106 of the NHPA or a historical resource for the purposes of CEQA.
Building 8: 101 Harrison Street and 400 Spear Street	This building has been determined by the City of San Francisco to appear individually eligible for listing on the NRHP through the survey process.	It is eligible for inclusion in the CRHR and is also considered a historical resource under CEQA (OHP, 2012).
Building 9: 444 and 470 Spear Street and Building 10: 2 Bryant Street	This building has been surveyed by the City of San Francisco and is considered to be a historic structure by the City (San Francisco Planning Department, 2011).	For the purposes of this project, it is considered potentially eligible for inclusion in the NRHP and CRHR and is considered a historical resource under CEQA.
Building 10: 2 Bryant Street	The building has not been formally evaluated, but is considered a potentially historic resource by the City of San Francisco (San Francisco Planning Department, 2011).	For the purposes of this project, it is considered potentially eligible for inclusion in NRHP and CRHR and is considered a historical resource for the purposes of CEQA.
Building 11: Pier 28	The pier is part of the Port of San Francisco Embarcadero Historic District and is listed on the NRHP as a contributor to the district. It is a known historic resource in the City of San Francisco (San Francisco Planning Department, 2012).	It is listed on the CRHR and is considered a historical resource for the purposes of CEQA (OHP, 2012).
Building 12: HiDive Restaurant/Pier 28 1/2	It was surveyed in 1976 as a historic resource and is a known historic resource in the City of San Francisco. It was evaluated in 1997 as contributing to the NRHP-eligible Port of San Francisco Embarcadero Historic District (San Francisco Planning Department, 2011).	The district was listed on the NRHP in 2006 (National Register #06000372). The building is listed on the CRHR and is considered a historical resource for the purposes of CEQA (OHP, 2012).

TABLE 3.5-4
Buildings Along or Adjacent to Onshore Portions of the Proposed Route
Embarcadero-Potrero 230 kV Transmission Project

Building/Location	Regulatory Summary	Eligibility
Building 13: Red's Java House/Pier 30	This building is considered a historic resource by the City of San Francisco (San Francisco Planning Department, 2011).	For the purposes of this project, this building is considered potentially eligible for inclusion in the NRHP and CRHR and is considered a historical resource under CEQA.
Structure 14: Pier 28 Bulkhead	This section of sea wall is known as the Pier 28 Bulkhead, was constructed between 1899 and 1912 and is considered part of the Port of San Francisco Embarcadero Historic District (National Register #06000372). It is considered a known historic resource by the City of San Francisco (San Francisco Planning Department, 2012).	The sea wall is listed on the CRHR and is considered a historical resource for the purposes of CEQA (OHP, 2012).
Structure 15: San Francisco-Oakland Bay Bridge	The bridge has been determined eligible for listing on the NRHP under criteria A, B, and C (National Register #00000525).	It is listed on the CRHR and is considered a historical resource for the purposes of CEQA (OHP, 2012).
Southern Land Section		
Building 16: Mirant Potrero Power Plant	A tall concrete stack lies on the bay side of the existing, apparently modern power plant structure. The stack appears on the historical aerial photographs and was built in the 1960s.	For the purposes of this project, it is considered potentially eligible for inclusion in the NRHP and CRHR and is considered a historical resource under CEQA (Appendix D).
Buildings 17 and 18: Western Sugar Refinery Warehouses	These warehouses were evaluated in 2001 and determined to be eligible for the CRHR as the last remaining structures associated with the Western Sugar Refinery under Criterion 1 at a local level of significance (OHP, 2012).	The warehouses are considered to be historical resources by the City and County of San Francisco (San Francisco Planning Department, 2012) and are historical resources for the purposes of CEQA. They are considered eligible for the NRHP for the purposes of this project.
Building 19: Station A-Manufactured Gas Plant	The CHRIS Historic Property Datafile for San Francisco currently lists the remaining buildings of the Station A complex as status "7," indicating the Office of Historic Preservation has received information on the resources, but has not made a determination (OHP, 2012). The City of San Francisco considers the Station A complex to be historically significant and the CEC and City have determined the four buildings within Station A meet CRHR criteria (URS Corporation, 2006: 4.7-3).	The standing structures at Station A are considered potentially eligible for inclusion in the NRHP and CRHR and are considered a historical resource under CEQA. The foundations present on site represent the historical location of a tank and shops that were removed around 2004 and no longer contain integrity to qualify for the NRPH and CRHR. They do not contain scientific value under Criterion D and are not considered individual historical resources for the purposes of CEQA (Appendix D).
Building 20: 2349 – 2353 3rd Street	This building has been evaluated as ineligible for local listing or designation, and is ineligible for the NRHP or CHRH (San Francisco Planning Department, 2011).	Because of the building's ineligibility for any local or national listing or designation, it is not considered a historical resource of the purposes of CEQA (Appendix D).
Building 21:2501 3rd Street	The building is considered a known historic resource by the City of San Francisco (San Francisco Planning Department, 2011)..	This building is considered potentially eligible for inclusion in the NRHP and CRHR and is considered a historical resource under CEQA (OHP, 2012).

3.5.3 Applicant-Proposed Measures and Potential Impacts

3.5.3.1 Significance Criteria

Project impacts on paleontological resources were evaluated based on the paleontological sensitivity ratings, which have been developed as practical means of evaluating the significance of impacts to paleontological resources. In accordance with Appendix G of the CEQA Guidelines, project impacts on paleontological resources may be considered significant if the project would directly or indirectly destroy a unique paleontological resource or site. Because any paleontological site could be considered "unique," sensitivity ratings are employed by practicing paleontologists (e.g., SVP, 1995) to better understand of the severity of impact, and are applied to the determination of significance. The sensitivity ratings provided above in Table 3.5-2, which combine a number of relevant considerations, are considered in light of the nature of subsurface disturbance associated with this project, and the significance of impacts is determined based on that information.

Project impacts on cultural resources are defined by Section 106 of the NHPA and CEQA as a change in the characteristics of a resource that convey its significance or justify its eligibility for inclusion in the NRHP, CRHR, or local register. Direct impacts may occur by physically damaging, destroying or altering all or part of a resource; altering characteristics of the surrounding environmental setting that contribute to a resource's significance; allowing a resource to deteriorate through neglect; or incidental discovery of archaeological resources without proper notification. Direct impacts can be assessed by determining the exact location of historical resources and assessing their significance under NRHP and CEQA criteria, identifying the types and extent of the proposed impacts and their effect on significant resources, and determining appropriate mitigation. Indirect impacts may include changes to the view shed of a significant resource through introduction of a new project element.

CEQA recommends avoidance or preservation in place as the preferred treatment for eligible properties and unique or significant archaeological or historical resources (PRC 21083.2). If avoidance is not a feasible option, then data recovery is the usual treatment. For architectural resources, physical changes to a property, excluding demolition, can be treated following the Secretary of Interior Standards and Guidelines for rehabilitation or renovation and can reduce impacts to a less-than-significant level.

3.5.3.2 Applicant-Proposed Measures

Cultural Resources

APM CUL-1: Pre-Construction Worker Cultural Resources Training. Prior to construction, PG&E will design and implement a Worker Cultural Resources Training Program for all project personnel who may encounter and/or alter historical resources or unique archaeological properties. Construction supervisors, workers, and other field personnel will be required to attend the training program prior to their involvement in field operations. The program will be conducted in conjunction with other environmental awareness training and education for the project. The cultural resources training session will be led by a qualified instructor meeting the Secretary of Interior's Professional Qualification Standards as listed beginning on page 44716 of Volume 48 of the Federal Register and as may be updated by the National Park Service.

This Program will minimally include:

- A review of the environmental setting (prehistory, ethnography, history) associated with the project;
- A review of Native American cultural concerns and recommendations during project implementation;
- A review of applicable federal, state, and local laws and ordinances governing cultural resources and historic preservation;
- A review of what constitutes prehistoric or historical archaeological deposits and what the workers should look out for;
- A discussion of site avoidance requirements and procedures to be followed in the event unanticipated cultural resources are discovered during construction;
- A discussion of procedures to follow in the event human remains are discovered during construction;

- A discussion of disciplinary and other actions that could be taken against persons violating historic preservation laws and PG&E policies;
- A discussion of eligible and potentially eligible built environment resources and procedures to follow regarding minimizing vibration from equipment in designated areas; and
- A statement by the construction company or applicable employer agreeing to abide by the program conditions, PG&E policies, and applicable laws and regulations.

APM CUL-2: Resource Avoidance. There are no known archaeological or historical resources within the direct impact areas defined for the proposed route. In keeping with the intent of the NHPA and CEQA, PG&E's preferred approach for archaeological resources and historical resources is avoidance of impacts to significant (or unevaluated) resources. Where avoidance is not feasible, potential impacts to significant cultural resources must be treated in a way that is acceptable to PG&E, the State Historic Preservation Officer (SHPO), and if applicable, the local Native American community. Treatment might include data recovery excavations, public interpretation/education, Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER) recordation, or other measures. If there is an unanticipated discovery of a buried archaeological deposit or human remains, or unanticipated impacts to a historical building cannot be avoided, PG&E will implement APM CUL-4, -5, and -7.

APM CUL-3: Construction Monitoring. Areas of high sensitivity for prehistoric or historical buried resources, as presented in Appendix D, will be monitored by a professional archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards. In particular, a monitor will be present during all ground-disturbing work within 100 feet (30 meters) of the unrecorded historical-era features west of Embarcadero Substation. Areas of moderate sensitivity will be spot-checked (i.e., visited by a qualified archaeologist one or more times per day) during construction. The exception to this is that all excavation at the Potrero GIS structure location should be monitored. The majority of the structure location is highly sensitive for buried historical resources while the remaining portion is moderately sensitive.

APM CUL-4: Unanticipated Discoveries of Cultural Deposits. In the event that previously unidentified archaeological, cultural, or historical sites, artifacts, or features are uncovered during implementation of the project, work will be suspended within 100 feet (30 meters) of the find and redirected to another location. PG&E's cultural resources specialist or designated representative will be contacted immediately to examine the discovery and determine if additional work is needed. If the discovery can be avoided or protected and no further impacts will occur, the resource will be documented on California Department of Parks and Recreation 523 forms and no further effort will be required.

If the resource cannot be avoided and may be subjected to further impacts, PG&E or their representative will evaluate the significance of the discovery following federal and state laws outlined above and implement data recovery or other appropriate treatment measures if warranted. Evaluation of historical-period resources will be done by a qualified historical archaeologist while evaluation of prehistoric resources will be done by a qualified archaeologist specializing in California prehistoric archaeology. Evaluations may include archival research, oral interviews, and/or field excavations to determine the full depth, extent, nature, and integrity of the deposit.

APM CUL-5: Unanticipated Discovery of Human Remains. If human remains or suspected human remains are discovered during construction, work within 100 feet of the find will stop immediately and the construction foreman shall contact the PG&E cultural resources specialist, who will then call the City and County of San Francisco Medical Examiner. There shall be no further excavation or disturbance of the site, or any nearby area reasonably suspected to overlie adjacent remains, until medical examiner has determined that the remains are not subject to provisions of Section 27491 of the Government Code. If the medical examiner determines the remains to be Native American, he/she shall contact the NAHC within 24 hours. The NAHC will appoint a Most Likely Descendent for recommendations on the treatment and disposition of the remains (Health and Safety Code Sect. 7050.5, Public Resources Code Sect. 5097.24).

APM CUL-6: Vibrations to Historical Structures. Historical buildings are present near the project route and may be vulnerable to damage from heavy equipment vibrations. To ensure that resources are not inadvertently

damaged or impacted during construction implementation, the crews will be informed of historical structure locations and instructed to confine all excavation and backfill work to the existing city streets right-of-way (historical structure locations are depicted in Appendix D as part of APM-CUL-1).

Project construction in proximity to Station A will include the use of Tubex and the smallest possible machinery to minimize vibration effects. A structural engineer will check the condition of the building prior to construction. Once activities that result in vibration have begun, the engineer will check the condition of the building to monitor Station A during construction (at 25 percent, 50 percent, 75 percent, and 100 percent completion of excavation using heavy equipment) and assess the effects on the building. If the structural engineer determines that structural integrity is compromised, the interior of the building will be documented following the procedures outlined in APM-CUL-7.

APM CUL-7: Record to Historic American Building Survey/Historic American Engineering Record Standards. Station A's setting will be affected by construction of the GIS building. The currently visible exterior façade on the west side of the main turbine building may be blocked from view.

Prior to construction, the setting and exterior of the Station will be documented using HAER standards. These standards include large format photography of the structures, photo reproduction of historical plans, mapping, and a descriptive and historical narrative. The resulting documentation will be archived with PG&E, the SHPO, the Bancroft Library at the University of California Berkeley, the San Francisco Landmarks Preservation Advisory Board files at the San Francisco Planning Department, the Foundation for San Francisco's Architectural Heritage, and the San Francisco Public Library.

Paleontological Resources

APM Paleontological Resources (PR)-1: Worker Environmental Awareness Program Paleontological Resources Module. The project's worker environmental awareness program, which all workers will complete prior to beginning work on the project site, will include a module on paleontological resources (fossils). The module will discuss the laws protecting paleontological resources, recognition in the field and types of paleontological resources that could be encountered on the project, and the procedures to be followed if a paleontological resource is discovered. A copy of the project's worker environmental awareness training will be provided to the CPUC for recordkeeping prior to the start of construction.

APM PR-2: Unanticipated Paleontological Resource Discovery. If fossils are observed during excavation, work in the immediate vicinity of a paleontological find will be halted or redirected to avoid additional impact to the specimen(s), and to allow a professional paleontologist to assess the scientific importance of the find and determine appropriate treatment. If the discovery is significant, the qualified paleontologist will implement data recovery excavation to scientifically recover and curate the specimen.

3.5.3.3 Potential Impacts

Potential impacts to archaeological and historical resources may occur during construction from the use of heavy equipment, excavation and subsurface disturbance, or construction and use of equipment staging and work area. These impacts can be reduced or minimized through implementation of APM CUL-1 through APM CUL-7.

The operations and maintenance of the project following construction will not result in impacts to identified cultural resources.

Construction

Prehistoric and Historical Archaeology

The majority of onshore work planned for the proposed route is confined to city streets. These streets have been in place for over a century and have been disturbed many times through the years through routine replacement and maintenance of City utility lines. Nineteenth century sewer lines are mapped along Spear and Folsom Streets, along the northern onshore portion of the route (Britton, 1899). Portions of the proposed onshore route have a moderate to high potential for near-surface or deeply buried deposits. Potential impacts to deeply buried and surface archaeological sites may occur during construction from the use of heavy equipment, excavation and

subsurface disturbance, or construction and use of equipment staging and work areas. These impacts can be reduced or minimized through implementation of APM CUL-1 through APM CUL-5.

Potrero Gas-Insulated Switchgear Structure Construction Impacts

The GIS structure is planned for an area adjacent to Potrero Switchyard that currently contains a circular tank foundation and other building foundations from Station A structures that were removed between 1983 and 2004 (URS Corporation, 2006). The foundations reflect the original design of Station A but do not contain scientific value. Removal or demolition of the foundation remains can be reduced to a less-than-significant impact through implementation of APM CUL-7.

In addition, design plans for the building include a 10-foot-deep basement, requiring further excavation at the GenOn site. Surface sensitivity for this area is moderate, while a small portion of the proposed basement area is of high sensitivity for deeply buried historical resources. These potential impacts to deeply buried sites from construction activities can be reduced or minimized through implementation of APM CUL-1 through APM CUL-5.

Embarcadero Substation Tie-In Impacts

The planned construction of a GIS structure west of Embarcadero Substation is being undertaken as a separate project (Waechter, 2012). See Chapter 5, Cumulative Impacts, for additional information on the Embarcadero Bus Upgrade Project. The northern end of the project route would tie into this new GIS structure. Work north of the planned Embarcadero Substation GIS structure has the potential to encounter buried historical-era features or deposits associated with the Wirth Site. The Wirth Site contains historical features and deposits that were identified during limited test excavations in 1979 and also could include as-yet-unidentified features or deposits which may exist to the north and east of the known features, as indicated on Sanborn maps (Waechter, 2012; Wirth, 1979a and 1979b). Potential impacts from construction activities to historical deposits that may exist north of the planned GIS structure at Embarcadero Substation can be reduced or minimized through implementation of APM CUL-1 through APM CUL-5.

Built Environment

Northern Section of Proposed Route

The majority of historical buildings along the northern onshore portion of the proposed project route line city streets (see Appendix D). Buildings 1 through 10 are situated along Spear and Folsom Streets. The use of heavy equipment on the streets in this area is not unusual; routine maintenance of underground utilities and road improvements occur on a regular basis. The construction project will not physically impact these buildings. The Klockar's Building (Building 1) is on the west side of Embarcadero Substation and will not be impacted by construction. Less-than-significant effects would occur through implementation of APM-CUL-1.

Other historical buildings and structures within the northern section of the proposed route along the Embarcadero and bay shore include Pier 28 (Bldg. 11), Buildings 12 and 13, the Port of San Francisco Bulkhead for Pier 28 (Bldg. 14), and the San Francisco-Oakland Bay Bridge (Bldg. 15). All boring is anticipated to be well below the level of the seawall of the bulkhead itself and the buildings that are set upon it. No trenching is anticipated near the anchorages of the San Francisco-Oakland Bay Bridge. As a result, none of the buildings or structures identified in this document as 11 through 15 will be impacted. Furthermore, the structures along the Embarcadero are part of the Port of San Francisco/Embarcadero Historic District. The proposed work will not affect that historic district in part or as a whole.

Southern Section of Proposed Route

Trenching and Boring Impacts. In the southern end of the proposed route, Buildings 17, 18 and 19 are located on both sides of 23rd Street and Building 21 is on Illinois Street, adjacent to the switchyard (see Appendix D). These four buildings would not be impacted by directional boring or trenching within the street itself or by work at the switchyard.

The concrete stack tower of the Merit Company plant, Building 16, is situated at the east end of 23rd Street. The structural integrity of this stack could be vulnerable to damage from heavy equipment vibrations. The proposed

project is located over 80 feet from the tower. Work near the tower will consist of HDD that will occur many feet below the ground. Vibrations will be minimal and will not impact the stack.

Potrero GIS Structure Construction Impacts. The GIS structure planned for the GenOn site is designed as a three-story structure with a maximum height of 35 feet. As currently planned, the building will be approximately 135 feet long and 62 feet wide, with the long axis extending along 23rd Street. A 10-foot-deep basement is planned for the space under the building. The east end of the GIS structure will be approximately 20 feet from the west façade of Station A (Building 19).

Buildings 16 and 17 are located at the east end of 23rd Street. The imposing brick turbine building of Station A will block the view of the GIS building, resulting in no impact to these two structures. No APMs are required. Building 18 is across 23rd Street diagonally from the proposed GIS structure and Building 21 fronts on Illinois Street, across the street from the switchyard. They are both located in an industrial setting and have industrial use. The construction of the GIS building, while visible from these buildings, is not considered a significant impact. Both buildings are located within the Pier 70 industrial area. The GIS structure is planned for a location that until recently contained a large tank and other structures associated with Station A. The proposed structure is in keeping with the industrial nature of the district and its addition into this industrial area would not be considered a significant alteration of the viewshed. Construction of the GIS structure will not alter the feel and setting of this industrial area and the impact of construction on these structures is considered less-than-significant. No APMs are required.

The proposed GIS structure is within approximately 20 feet of Station A (consisting of four structures collectively labeled as Building 19). The proposed structure will be approximately 35 feet tall, while the main turbine building at Station A is close to 65 feet in height. In addition, the main building at Station A is more than 400 feet long, while the GIS structure is approximately 35 feet long. Therefore, the GIS building will not detract from the historical massing of Station A. Construction of the new structure will not physically alter or impact the remaining buildings at Station A. Construction of the GIS structure will block the open view of the north side of the main turbine building at Station A and obscure its relationship with other, smaller brick structures situated at the north end of the site.

As pointed out above, over 50 percent of original buildings at Station A have been removed, an action that substantially changed the setting. The design of the proposed GIS structure is in keeping with the industrial nature of the area. Because the façade of Station A was blocked by a large boiler building in the past, the GIS structure obscuring a clear view of the west façade is not a new element. Therefore, construction of the GIS structure will result in a less-than-significant impact.

The brick wall that fronts Station A and the gate will be slightly modified by a connection with a new brick wall. The new wall will be designed to complement the historical Station A wall. The historical Station A wall will not be demolished.

Implementation of APM-CUL-7, focusing on capturing the existing setting (including foundations of former structures on site) and exteriors of the existing buildings and brick wall through photography, mapping and written documentation, will reduce the impact of these changes to a less-than-significant level.

Station A is an unreinforced masonry building that is vulnerable to vibration impacts. At this time, no pile driving activities are anticipated during construction of the GIS structure. Should additional building support be required, a non-piling method, such as the Tubex grout injection or similar technique, will be used. Such methods produce virtually no vibration and require no soil removal. These construction techniques, in conjunction with implementation of APMs CUL-1 and CUL-6, will result in a less-than-significant impacts to Station A.

Operations and Maintenance

Routine operations and maintenance of the project is not expected to produce significant vibrations or to necessitate sub-surface disturbances and will not result in impacts to identified cultural resources. The onshore portions of the project will be inspected from inside vaults that will be installed during the construction phase.

The submarine portions of the route will be monitored remotely and inspected annually by a marine surveyor (see Section 2.8.2, Maintenance and Facility Inspection).

In the event that repairs require sub-surface disturbances to any portion of the project, implementation of APMs CUL-1 through CUL-6 will result in a less-than-significant impact.

Once construction is complete, continued operation and maintenance will not result in changes to the viewshed.

a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5? ***Less than significant impact.***

Construction of the Potrero 230 kV GIS structure would modify the visual setting of Station A by introducing a new industrial building. It would also result in the removal of foundations from other structures at Station A that have been demolished in the past. The proposed GIS building, while altering the setting of Station A, will not result in removal of buildings, or change the relationships between the remaining Station A structures. The setting of Station A has been impacted in the past by removal of related buildings, construction of other industrial structures, and construction of the existing Potrero Switchyard. Implementation of APM-CUL-7 will document and record the setting of the Station and its few remaining buildings, resulting in a less than significant change. Therefore, the construction of the GIS building, while altering the existing setting of Station A, will not result in a substantial adverse change.

Excavation of a ten-foot-deep foundation for the GIS building may create vibrations that could affect the structural integrity of Station A and the remaining brick building. Implementation of APM CUL-1 and CUL-6 will result in a less-than-significant impact.

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5? ***Less than significant impact.***

No known archaeological sites are present along the project route. A study of known prehistoric site locations, historical shoreline maps, and historical land development has resulted in the identification of areas of low, moderate, and high sensitivity within the proposed route, Embarcadero Substation, Potrero Switchyard, and work areas for both prehistoric and historical resources. APMs CUL-1 through CUL-5 include environmental awareness training of crews, avoidance of resources, construction monitoring for areas designated as moderate to high sensitivity, recordation and investigation of resources that cannot be avoided, and actions to implement in the event that human remains are encountered during construction. Implementation of these APMs will ensure a less-than-significant impact during project construction.

c) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? ***Less-than-Significant Impact.***

The project does not occur near or on a unique geologic feature. Artificial fill, which possesses no paleontological sensitivity, occurs beneath Embarcadero Substation and Potrero Switchyard. At an unknown depth beneath artificial fill at Embarcadero Substation are sandstone and shale deposits of the Mesozoic Franciscan Complex, which possesses low paleontological sensitivity. At an unknown depth beneath artificial fill at Potrero Switchyard lies Mesozoic serpentinite, which possesses no paleontological sensitivity.

The onshore northern portion of the project alignment will require trenching through artificial fill and potentially some low sensitivity Holocene Bay Mud. The northern HDD will cross artificial fill, the moderate-sensitivity Pleistocene Colma Formation, and Bay Mud for most of the length of the HDD segment. The submarine portion placed by hydroplow will be located in sand or Bay Mud. The southern end of the project alignment is likely to affect Mesozoic serpentinite and artificial fill along the onshoe segment, and Holocene Bay Mud for the submarine segment.

Only activities affecting moderate-sensitivity Colma Formation sediments on the northern HDD route have the potential to affect paleontological resources. This excavation will involve three small-diameter (12-inch) HDD borings. If the three HDD borings enter the Colma Formation, it is possible that paleontological resources could

be impacted. However, given the moderate sensitivity of the Colma Formation and the limited effects of the 12-inch borings, no significant impacts to paleontological resources will occur.

Thus, drilling activities within the moderate sensitivity Colma Formation and low-sensitivity Franciscan Complex and Bay Mud are unlikely to impact scientifically important paleontological resources, and therefore impacts to paleontological resources resulting from this project will be less than significant.

d) Would the project disturb any human remains, including those interred outside of formal cemeteries? ***No impact.***

The proposed project does not impact any formal cemeteries. Project impacts to human remains are not anticipated; therefore, no impacts are expected. If human remains are discovered, PG&E will implement APM CUL-5.

3.5.4 References

Anderson, F. M. 1938. *Lower Cretaceous Deposits in California and Oregon: Geological Society of America Special Paper.* 16, 339 p.

Atwater, B. F. 1979. "Ancient Processes at the Site of Southern San Francisco Bay: Movement of the Crust and Changes in Sea Level." In *San Francisco Bay: The Urbanized Estuary: Investigations into the Natural History of San Francisco Bay and Delta With Reference to the Influence of Man* (p. 31-45). Pacific Division of the American Association for the Advancement of Science c/o California Academy of Sciences Golden Gate Park, San Francisco, California 94118

Banks, Peter M., and Robert I. Orlins. 1981. *Investigation of Cultural Resources within the Richmond Harbor Redevelopment Project 11-A, Richmond, Contra Costa County, California*. California Archaeological Consultants, Inc., Woodland, California. Submitted to City of Richmond. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, California.

Bean, Lowell John. 1994. *The Ohlone: Past and Present: Native Americans of the San Francisco Bay Region*. Ballena Press Anthropological Papers No. 42, Menlo Park.

Bickel, Polly M. 1978. "Changing Sea Levels along the California Coast: Anthropological Implications." *Journal of California Anthropology* 5(1):6-20.

Black & Veatch. 2012. *Final Embarcadero To Potrero Za-1 230kv Underground Transmission Project Feasibility Study.* B&V PROJECT NO. 173915.42.3008. Prepared for Pacific Gas & Electric Company, Inc. May.

Britton. 1899. Historical sewer line map.

Bunse, Meta. 2012. *Memorandum: Historical Resources Adjacent to the Embarcadero Project*. From Meta Bunse, JRP Historical Consulting, to Christophe Descantes, PG&E. May 26, 2012. On file, PG&E.

Byrd, Brian F., Philip Kaijankoski, Jack Meyer, Adrian Whitaker, Rebecca Allen, Meta Bunse, and Brian Larson. 2010. *Archaeological Research Design and Treatment Plan for the Transit Center District Plan Area, San Francisco, California.* Prepared for the San Francisco Planning Department, at the request of Reuben & Junius, LLP, San Francisco, California. Far Western Anthropological Research Group, Inc.; Past Forward, Inc.; and JRP Historical Consulting, LLC.

California Department of Transportation (Caltrans). 1990. *Historic Highway Bridges of California*. Sacramento.

California Office of Historic Preservation (OHP). 1983. *Summary of State/Federal Laws Protecting Cultural Resources*.

California Office of Historic Preservation (OHP). 2012. "Historic Property Data File, San Francisco County." List updated April 5, 2012. On file at California Historic Resources Information System, Northwest Information Center (NWIC), Rohnert Park, California.

Cartier, Robert. 1993. *The Scotts Valley Site: CA-SCR-177*. Santa Cruz Archaeological Society, Santa Cruz.

Clark, M.R. 1989. *Evaluative Archaeological Investigations at the San Bruno Mountain Mound Site, CA-SMA-40, South San Francisco, California*.

Crespí, Juan, O.F.M. [1772] 1927. *Fray Juan Crespí: Missionary Explorer on the Pacific Coast 1769-1774.* University of California Press, Berkeley and Los Angeles.

Davis, James T. 1961. *Trade Routes and Economic Exchange among the Indians of California*. Reports of the University of California Archaeological Survey 54:1-71. University of California, Berkeley, Department of Anthropology.

Delgado, James P. 2009. *Gold Rush Port: The Maritime Archaeology of San Francisco's Waterfront.* University of California Press, Berkeley, California.

Erlandson, Jon M., Michael H. Graham, Bruce J. Bourque, Debra Corbett, James A. Estes, and Robert S. Steneck. 2007. "The Kelp Highway Hypothesis: Marine Ecology, the Coastal Migration Theory, and the Peopling of the Americas." *Journal of Island & Coastal Archaeology*, 2:161–174.

Fitzgerald, Richard T., Jr. 1993. *Archaic Milling Cultures of the Southern San Francisco Bay Region*. Edited by Gary S. Breschini and Trudy Haversat. Coyote Press Archives of California Prehistory Number 35. Coyote Press, Salinas, California.

Gerow, Bert A. with Roland W. Force. 1968. *An Analysis of the University Village Complex: with a Reappraisal of Central California Archaeology*. Stanford University Press, Stanford, California.

Ghent, E. D. 1963. *Fossil Evidence for Maximum Age of Metamorphism in Part of the Franciscan Formation, Northern Coast Ranges, California*. California Division of Mines and Geology Special Report 82, p. 41.

Gifford, Edward W. 1916. *Dichotomous Social Organization in South Central California*. University of California Publications in American Archaeology and Ethnology 11(5):291-296.

Greengo, Robert E. 1951. *Molluscan Studies in California Shell Middens*. Reports of the University of California Archaeological Survey 13. University of California, Berkeley, Department of Anthropology.

Groza, Randall Gannon. 2002. An AMS Chronology for Central California *Olivella* Shell Beads. Master's thesis, Department of Anthropology, San Francisco State University, San Francisco.

Harrington, John P. 1942. "Culture Elements Distribution, XIX: Central California Coast." *University of California Anthropological Records* 7(1):1-46.

Harris, Edward. 1979. "The Laws of Archaeological Stratigraphy." *World Archaeology* 11:111-117.

Harris, Edward. 1989. *Principles of Archaeological Stratigraphy*. 2nd edition. Academic Press, London, UK.

Hattori, Eugene M., and Allen G. Pastron. 2008. *Prehistory of the Yerba Buena Site, San Francisco, California*. Third Draft. Manuscript in possession of authors (Far Western).

Haynes, Gregory M. 2002. *The Early Settlement of North America: The Clovis Era*. Cambridge University Press, Cambridge.

Helley, E. J., Lajoie, K. R., Spangle, W. E., and Blair, M. L. 1979. *Flatland Deposits of the San Francisco Bay Region, California — Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning*. U. S. Geological Survey Professional Paper 943. 88 p.

Henn, Winfield, Thomas Jackson, and J. Schlocker. 1972. "Buried Human Bones at the 'Bart' Site, San Francisco." *California Geology* 25(9):208-209.

Hildebrandt, William R. 1983. *Archaeological Research of the Southern Santa Clara Valley Project: Based on a Data Recovery Program from Sites CA-SCl-54, CA-SCl-163, CA-SCl-178, CA-SCl-237, and CA-SCl-241 Located in the Route 101 Corridor, Santa Clara County, California*. Daniel, Mann, Johnson, and Mendenhall and San Jose State University, Los Angeles and San Jose. Submitted to California Department of

Transportation, District 4, San Francisco. Report S-6369. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, California.

Hughes, Richard E., and Randall Milliken. 2007. "Prehistoric Material Conveyance." In *California Prehistory: Colonization, Culture, and Complexity*, Terry L. Jones and Kathryn Klar, pp. 259-272. Altamira Press, Walnut Creek, California.

Hupman, Jan M., and David Chavez. 1997. *Archaeological Resources Investigations for the Transbay Redevelopment Project, San Francisco, CA*. Submitted to Environmental Science Associates, Inc., San Francisco, and San Francisco Redevelopment Agency by David Chavez & Associates, Mill Valley, California.

Jones, Terry L. and Jennifer Darcangelo. 2007. *Archaeological Data Recovery at CAL-ALA-17, Alameda County, California*. Submitted to Caltrans.

Kaijankoski, Philip. 2008. Site record for CA-SFR-151/H. On file at the Northwest Information Center, Sonoma State University, Rohnert Park, California.

Kroeber, Alfred L. 1925. *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78. Smithsonian Institution, Washington, DC. (Reprinted by Dover Publications, New York, 1976.)

Kroeber, Alfred L. 1962. "The Nature of Land-holding Groups in Aboriginal California." In *Two Papers on the Aboriginal Ethnography of California*. Del H. Hymes and Robert Heizer, pp. 19-58 University of California Survey Reports 56, Berkeley, California.

Lajoie, K. R., Helley, E. J., Nichols, D. R., and Burke, D. B. 1974. Geologic Map of Unconsolidated and Moderately Consolidated Deposits of San Mateo County, California. U.S. Geological Survey Miscellaneous Field Studies Map MF-575, scale 1:62,500.

Laston, R.J. and S. Mezes. 1858. Map of the San Bruno Turnpike Road. On file, Planning Department, City of San Francisco.

Levy, Richard S. 1978. "Costanoan." In *California*, edited by Richard F. Heizer, pp. 485-495. Handbook of North American Indians 8, William C. Sturtevant general editor. Smithsonian Institution, Washington, DC.

Lightfoot, Kent G. 1997. "Cultural Construction of Coastal Landscapes: A Middle Holocene Perspective from San Francisco Bay." In *Archaeology of the California Coast during the Middle Holocene*, edited by Jon M. Erlandson and Michael A. Glassow, pp. 129-142. Perspectives in California Archaeology 4, Jeanne E. Arnold. Institute of Archaeology, University of California, Los Angeles.

Lightfoot, Kent G., and Edward M. Luby. 2002. "Late Holocene in the San Francisco Bay Area: Temporal Trends in the Use and Abandonment of Shell Mounds in the East Bay." In *Catalysts to Complexity: Late Holocene Societies of the California Coast*, edited by Jon M. Erlandson and Terry L. Jones, pp. 263-281. Perspectives in California Archaeology 6, Series Editor Jeanne E. Arnold. Cotsen Institute of Archaeology, University of California, Los Angeles.

Loud, L. 1912. *Presidio Mound #417*. University of California Archaeological Survey manuscripts, 362. Archaeological Research Facility, University of California Berkeley.

McDonald, S. D.; Nichols, D. R.; Wright, N. A.; Atwater, Brian. 1978. Map showing thickness of young bay mud, southern San Francisco Bay, California. USGS Miscellaneous Field Studies Map: 976.

McIlroy, Jack, Jack Meyer, and Adrian Praetzellis. 2001. *Geoarchaeological and Archaeological Investigations for the Central Freeway Seismic Retrofit Project*. Anthropological Studies Center, Sonoma State University, Rohnert Park, California. Submitted to the California Department of Transportation, District 4, Oakland.

Meyer, Jack. 2005. *Geoarchaeological Study of the Marsh Creek Site (CA-CCO-18 and CA-CCO-548) Eastern Contra Costa County, California*. Anthropological Studies Center, Sonoma State University, Rohnert Park.

Meyer, Jack. 2011. *Buried Archaeological Site Assessment and Extended Phase I Subsurface Explorations for the I-80 Integrated Corridor Mobility Project, California Department of Transportation District 04, Alameda and*

Contra Costa Counties, California. Far Western Anthropological Research Group, Inc., Davis, California. Report submitted to Kimley-Horn Associates, Inc., San Diego and Oakland, California.

Meyer, Jack, and Jeffrey S. Rosenthal. 1997. "Archaeological and Geoarchaeological Investigations at Eight Prehistoric Sites in the Los Vaqueros Reservoir Area, Contra Costa County." In *Los Vaqueros Project Final Report*. Anthropological Studies Center, Sonoma State University, Rohnert Park, California. Submitted to the Contra Costa Water District, Concord. Report on file, Northwest Information Center, Sonoma State University, Rohnert Park, California.

Meyer, Jack, and Jeffrey S. Rosenthal. 1998. *An Archaeological Investigation of Artifacts and Human Remains from CA-CCO-637, Los Vaqueros Project Area, Contra Costa County, California.* Anthropological Studies Center, Sonoma State Academic Foundation, Inc., Rohnert Park, California. Submitted to Contra Costa Water District, Concord, California.

Meyer, Jack, and Jeffrey S. Rosenthal. 2007. *Geoarchaeological Overview of the Nine Bay Area Counties in Caltrans District 4*. Far Western Anthropological Research Group, Inc., Davis, California. Report submitted to California Department of Transportation, District 4, Oakland, California.

Meyer, Jack, and Jeffrey S. Rosenthal. 2008. *A Geoarchaeological Overview and Assessment of Caltrans District 3—Cultural Resources Inventory of Caltrans District 3 Rural Conventional Highways*. Far Western Anthropological Research Group, Inc., Davis, California. Report submitted to California Department of Transportation, District 3, Marysville, California.

Meyer, Jack, Philip Kaijankoski, and Jeffrey S. Rosenthal. 2011. *A Geoarchaeological Overview and Assessment of Northwest—California Cultural Resources Inventory of Caltrans District 1 Rural Conventional Highways: Del Norte, Humboldt, Mendocino, and Lake Counties*. Far Western Anthropological Research Group, Inc., Davis, California. Report submitted to California Department of Transportation, District 1, Eureka, California.

Meyer, Jack, D. Craig Young, and Jeffrey S. Rosenthal. 2010. A Geoarchaeological Overview and Assessment of Caltrans Districts 6 and 9 - Cultural Resources Inventory of Caltrans District 6/9 Rural Conventional Highways. Far Western Anthropological Research Group, Inc., Davis, California. Report submitted to California Department of Transportation, District 6, Fresno.

Milliken, Randall T. 1983. *The Spatial Organization of Human Population on Central California's San Francisco Peninsula at the Spanish Arrival*. Master's thesis, Cultural Resource Studies, Sonoma State University, Rohnert Park.

Milliken, Randall T. 1995. *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769-1810*. Ballena Press Anthropological Papers, No. 43. Thomas C. Blackburn Editor. Ballena Press, Menlo Park, California.

Milliken, Randall T. 2006. *The Central California Ethnographic Community Distribution Model, Version 2.0, with Special Attention to the San Francisco Bay Area—Cultural Resources Inventory of Caltrans District 4 Rural Conventional Highways*. Prepared by Consulting in the Past and Far Western Anthropological Research Group, Inc., Davis, California. Submitted to Office of Cultural Resource Studies, California Department of Transportation District 4, Environmental Division.

Milliken, Randall, Richard T. Fitzgerald, Mark G. Hylkema, Randy Groza, Tom Origer, David G. Bieling, Alan Leventhal, Randy S. Wiberg, Andrew Gottsfield, Donna Gillette, Viviana Bellifemine, Eric Strother, Robert Cartier, and David A. Fredrickson. 2007. "Punctuated Culture Change in the San Francisco Bay Area." In *California Prehistory: Colonization, Culture, and Complexity*, Terry L. Jones and Kathryn Klar, pp. 99-124. Altamira Press, Walnut Creek, California.

Nelson, N. C. 1909. *Shellmounds of the San Francisco Bay Region*. University of California Publications in American Archaeology and Ethnology 7(4):310-356.

Nelson, N.C. 1910a. *Bayshore Mound #387*. Phoebe A. Hearst Museum of Anthropology Manuscript 355, University of California Berkeley.

Nelson, N.C. 1910b. *The Ellis Landing Shellmound*. University of California Publications in American Archaeology and Ethnology 8. University of California Press, Berkeley.

OHP. See California Office of Historic Preservation

Olmsted, Roger and Nancy Olmsted. 1982. *San Francisco Bayside Historical Cultural Resource Survey*. Report on file Northwest Information Center.

Pastron, Allen G. 1990. *Rincon Point/South Beach Redevelopment Project Parcel E: The Bayside Village Site Archaeological Testing and Data Recovery Program*. Submitted to San Francisco Redevelopment Agency, San Francisco.

Pastron, Allen G., and Eugene M. Hattori. 1990. *The Hoff Store Site and Gold Rush Merchandise from San Francisco, California*. The Society for Historical Archaeology, Special Publication Series No. 7. California, PA.

Pastron, A. G., and M. R. Walsh. 1988a. *Archaeological Excavations at CA-SFR-112, The Stevenson Street Shellmound, San Francisco, California*. Archives of California Prehistory 21. Coyote Press, Salinas, California.

Pastron, A.G., and M. R. Walsh. 1988b. *Archaeological Excavations at CA-SFR-113, The Market Street Shell Midden: A Prehistoric Archaeological Site, San Francisco, California*. Archives of California Prehistory 25. Coyote Press, Salinas, California.

Pohl, Gary. 2003. *The Archaeology of de Silva Island, CA-MRN-17*. Treganza Museum Publication 17, Tiburon Archaeological Research Group Publication 2.

Praetzellis, Mary, E.S. Gibson, J. Mc Ilroy, J, Meyer, M.D. Meyer, B. Owen, A. Praetzellis, and A. Waghorn. 2004. *SF-80 Bayshore Viaduct Seismic Retrofit Projects Report on Construction Monitoring, Geoarchaeology, and Technical and Interpretive Studies for Historical Archaeology.* Anthropological Studies Center, Rohnert Park, California. Submitted to California Department of Transportation, District 4, Oakland.

Praetzellis, Mary, and Adrian Praetzellis (editors). 2009. *South of Market: Historical Archaeology of 3 San Francisco Neighborhoods. The San Francisco-Oakland Bay Bridge West Approach Project.* Two volumes. Anthropological Studies Center, Sonoma State University, Rohnert Park, California. Prepared for California Department of Transportation, District 04, Oakland.

Reed, Charles. 1976. *Historical Archaeological Investigations in San Francisco, Corner of Market and Fremont.* Report on file, Northwest Information Center, California Historical Resources Information System, Sonoma State University, Rohnert Park, California.

Rodda, P. U., and Baghai, N. 1993. "Late Pleistocene Vertebrates from Downtown San Francisco, California." *Journal of Paleontology* Vol. 67, pp. 1,058-1,063.

Rondeau, Michael F., Jim Cassidy, and Terry L. Jones. 2007. "Colonization Technologies: Fluted Projectile Points and the San Clemente Island Woodworking/Microblade Complex." In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn Klar, pp. 63-70. Altamira Press, Walnut Creek, California.

Rosenthal, Jeffrey S., and Jack Meyer. 2004. *Landscape Evolution and the Archaeological Record: A Geoarchaeological Study of the Southern Santa Clara Valley and Surrounding Region*. Center for Archaeological Research at Davis Publication 14, University of California, Davis.

San Francisco Planning Department. 2011. "San Francisco Property Information Map" Website. Online: http://ec2-50-17-237-182.compute-1.amazonaws.com/PIM/. Accessed October 2012.

San Francisco Planning Department. 2012. "Historic Preservation" Web page. Online: http://sfplanning.org/index.aspx?page=1825#landmarks. Accessed June 2012.

Savage, D. E. 1951. "Late Cenozoic Vertebrates of the San Francisco Bay Region." *University of California Publications, Bulletin of the Department of Geological Sciences* Vol. 28, No. 10, pp. 215-314.

Schenck, W. Egbert. 1926. *Historic Aboriginal Groups of the California Delta Region*. University of California Publications in American Archaeology and Ethnology 23(2):123-146, Berkeley, California.

Schlocker, J. 1974. *Geology of the San Francisco North Quadrangle, California*. U.S. Geological Survey Professional Paper 782, 109 p., scale 1:24,000.

Schlocker, J., Bonilla, M. G., and Radbruch, D. H. 1958. Geology of the San Francisco North Quadrangle, California. U. S. Geological Survey Miscellaneous Geologic Investigations Map I-272, scale 1:24,000.

Simons, Dwight D. 1992. Prehistoric Mammal Exploitation in the San Francisco Bay Area. In *Essays on the Prehistory of Maritime California*, edited by Terry L. Jones, pp. 73-104. Center for Archaeological Research at Davis Publication 10, University of California, Davis.

Society of Vertebrate Paleontology (SVP). 1995. "Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources B Standard Guidelines." *Society of Vertebrate Paleontology News Bulletin* 163:22–27.

Sonoma State University. 1993. *Tar Flat, Rincon Hill, and the Shore of Mission Bay: Archaeological Research Design and Treatment Plan for SF-480 Terminal Separation Rebuild*. M. Praetzellis and A. Praetzellis, eds. Prepared for Caltrans District 4, Oakland. Anthropological Studies Center, Rohnert Park, California.

Stewart, R. B. 1930. *Gabb's California Cretaceous and Tertiary Type Lamellibranches*. Philadelphia Academy of Natural Science Special Publication 3, 314 p.

Taliaferro, N. L. 1951. *Geology of the San Francisco Bay Counties: California Division of Mines Bulletin 154*, pp. 117-150.

U.S. Bureau of Land Management (BLM). 2008. *Potential Fossil Yield Classification System for Paleontological Resources on Public Lands.* U.S. Department of the Interior. Instructional Memorandum 2008-009. Washington, D.C.

Uhle, Max. 1907. *The Emeryville Shellmound*. University of California Publications in American Archaeology and *Ethnology* 7(1):1-106.

University of California Museum of Paleontology (UCMP). 2012. "About the UCMP Collections Catalog" website. Online: http://ucmpdb.berkeley.edu/about.shtml.

URS Corporation (URS). 2006. *Draft Environmental Impact Report for the Proposed Trans Bay Cable Project.* Prepared by URS Corporation, Oakland, for the City of Pittsburg, California.

VerPlanck, Christopher. 2003. *Dogpatch Neighborhood Survey.* VerPlanck Historic Preservation Consulting, San Francisco. Accessed electronically June 2, 2012. http://pier70sf.cor/dogpatch/doghistsig.htm

Waechter, Sharon A. 1992. *Report on the 1992 Test Excavations at CA-CCO-474/H near Hercules, Contra Costa County, California.* Prepared for Woodward-Clyde Associates, Oakland, California. Far Western Anthropological Research Group, Inc., Davis, California.

Waechter, Sharon A. 2012. *Archaeological Site Sensitivity Analysis for the PG&E Embarcadero Substation Addition, San Francisco, California*. Prepared by Far Western Anthropological Research Group, Inc., Davis, California.

Wahrhaftig, C., and Sloan, D. (Editors). 1989. *Geology of San Francisco and Vicinity*. 28th International Geological Congress Field Trip Guidebook T105. 59 p.

Wahrhaftig, C., Stine, S. W., and Huber, N. K. 1993. Quaternary Geologic Map of the San Francisco Bay 4^{o} x 6^{o} Quadrangle, United States. U. S. Geological Survey Miscellaneous Investigations Map I-1420, scale 1:1,000,000.

Wallace, W. J., and D. W. Lathrap. 1975. *West Berkeley (CA-ALA-307): A Culturally Stratified Shellmound On the East Shore of San Francisco Bay*. Contributions of the University of California Archaeological Research Facility 29.

Wiberg, Randy S. 1996. *Archaeological Excavations and Burial Removal at Sites CA-ALA-483, CA-ALA-483 Extension, and CA-ALA-555, Pleasanton, Alameda County, California*. Holman and Associates, San Francisco, California. Submitted to Davidson Homes, Walnut Creek. Report on file, Northwest Information Center, Sonoma State University, California.

Wirth Associates, Inc. 1979a. *Potrero 7: Phase I Cultural Resources Overview and Inventory*. Prepared for Pacific Gas and Electric Company, San Francisco, California.

Wirth Associates, Inc. 1979b. *Potrero 7: Phase II Archaeological Test Excavations.* Prepared for Pacific Gas and Electric Company, San Francisco, California.

Wohlgemuth, Eric. 2004. *The Course of Plant Food Intensification in Native Central California.* Ph.D. dissertation, Department of Anthropology, University of California, Davis.

3.6 Geology and Soils

3.6.1 Introduction

This section describes existing geological and soil conditions and associated potential geologic, seismic, and geotechnical hazards. It then describes potential impacts and applicant-proposed measures (APMs) for the project.

The project is located in a seismically active area and the project area has underlying young geologic deposits. Geologic and seismic hazards with the greatest potential to impact the project include strong ground shaking and seismic-induced ground failure. Geotechnical hazards with the greatest potential to impact the project include expansive, soft, loose, and/or compressible soils. Additionally, unstable soil conditions may affect underground portions of the proposed project and adjacent facilities during excavation, grading, and backfill operations associated with project construction.

Potential impacts for the project are evaluated using the CEQA criteria presented in Table 3.6-1. As shown, all potential impacts to geology and soils are considered less than significant or nonexistent. With the implementation of the APMs presented in Section 3.6.4.2, which provide for geotechnical investigations and appropriate engineering and construction measures, any potential impacts will be reduced to less-than-significant levels or eliminated entirely.

TABLE 3.6-1
CEQA Checklist for Geology and Soils
Embarcadero-Potrero 230 kV Transmission Project

VI. GEOLOGY AND SOILS **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporation**	**Less than Significant Impact**	**No Impact**
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☑
ii) Strong seismic ground shaking?	☐	☐	☑	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☑	☐
iv) Landslides?	☐	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☑	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☑	☐
d) Be located on expansive soil, as defined in Section 1802.3.2 of the California Building Code (2007 or 2010) creating substantial risks to life or property?	☐	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☑

3.6.2 Regulatory Background and Methodology

3.6.2.1 Regulatory Background

Federal or Federal Delegated

No federal requirements are applicable to geological or soil conditions or potential geological and geotechnical hazards for the project.

State or State Delegated

Various state regulations include requirements for the safe construction of structures in geologically sensitive areas. Such regulations include Title 24 of CCR, also referred to as the California Building Standards Code, which sets building construction standards for safety and protection in the event of ground shaking, and the Geologic Hazard Zones Act of the California State Mining and Geology Board, which requires the mapping of seismically active and hazardous areas. California's earthquake protection law (California Health and Safety Code 19100 et seq.) requires the design of buildings to include safety provisions to resist stresses produced by lateral forces caused by wind and earthquakes.

Alquist-Priolo Earthquake Fault Zoning Act. California enacted the Alquist-Priolo Special Studies Zones Act in 1972, which was renamed the Alquist-Priolo Earthquake Fault Zoning Act in 1994. Also known as the Alquist-Priolo Act, it requires the establishment of "earthquake fault zones" along known active faults in California. Regulations on development within these zones are enforced to reduce the potential for damage resulting from fault displacement. Information on earthquake fault zones is provided for public information purposes (see Section 3.6.3.5, Seismicity, for further discussion). The Seismic Hazards Mapping Act (SHMA) of 1990 addresses earthquake hazards other than fault rupture, including liquefaction and seismically induced landslides. Seismic hazard zones are to be mapped by the State Geologist to assist local governments in land use planning.

The SHMA states that "it is necessary to identify and map seismic hazard zones in order for cities and counties to adequately prepare the safety element of their general plans and to encourage land use management policies and regulations to reduce and mitigate those hazards to protect public health and safety." Section 2697(a) of the SHMA additionally requires that "cities and counties shall require, prior to the approval of a project located in a seismic hazard zone, a geotechnical report defining and delineating any seismic hazard."

Local

Because CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary regulations relating to geology and soils. The following analysis of local regulations is provided for informational purposes and to assist with CEQA review.

San Francisco General Plan Community Safety Element. The San Francisco General Plan Community Safety Element is in the process of being updated, with the most recent available draft dated April 2012. The most recent approved version of the Community Safety Element was adopted by the Planning Commission on April 27, 1997, and approved by the Board of Supervisors on August 11, 1997. This Element contains policies that require new structures built in areas where site conditions could pose hazards, such as liquefaction or landslide, to be constructed in ways that reduce those hazards. Policy 2-3 is to "consider site soils conditions when reviewing projects in areas subject to liquefaction or slope instability." Policy 2-9 is to "consider information about geologic hazards whenever City decisions that will influence land use, building density, building configuration or infrastructure are made" (City of San Francisco, 1997).

3.6.2.2 Methodology

Existing conditions were evaluated following a review of available published and unpublished literature, as referenced at the end of this chapter. The primary resource used in the evaluation is *Embarcadero to Potrero ZA-1 230 kV Underground Transmission Project Feasibility Study* ("the feasibility study"; Black & Veatch [B&V], 2012).

Potential geotechnical hazards were evaluated based on interpretation of available geologic maps and reports. Multiple sources were used to identify faults within a distance of 30 miles that may potentially affect the site,

including the United States Geological Survey (USGS, 2000a and b) and California Geological Survey (CGS, 2000a, b, and c). Assessment of the potential for fault rupture, seismic ground shaking from local and regional sources, and liquefaction-related ground deformation included a review of mapped fault locations. Hazard maps produced by the USGS and Association of Bay Area Governments (ABAG) which depict liquefaction and lateral spreading hazards for the entire Bay Area in the event of a significant seismic event (Knudsen et al., 2000; ABAG, 2011) also were reviewed.

As part of the feasibility study, geotechnical evaluations were completed for the preliminary engineering design of the on-land portion of the project and transition portions of the marine alignment. An on-land subsurface investigation consisted of pushing 15 cone penetration tests (CPTs), as well as collecting and logging hand auger or air knife cuttings from 16 locations. In situ testing and sample collection was also completed at four of these locations (B&V, 2012). Additional, site-specific, final design-level geotechnical investigations will be necessary to evaluate subsurface conditions that may affect construction, operation, and maintenance of project facilities.

3.6.3 Existing Setting

3.6.3.1 Environmental Setting

Regional

The project area is on the San Francisco Peninsula, in the west-central part of the Coast Range Province of California. The Coast ranges, extending approximately 600 miles from the Oregon border to the Santa Ynez River near Santa Barbara, are characterized by elongate ranges and narrow valleys that are approximately parallel to the coast. Structural features, including faults and synclinal folds, largely control topography in the province and reflect both previous and existing regional tectonic regimes (Norris, 1990).

Local

The San Francisco Peninsula, bounded on the east by San Francisco Bay and on the west by the Pacific Ocean, belongs to the same topographic unit as the Santa Cruz Mountains, which extend approximately 80 miles in a southeasterly direction from San Francisco, at the northern end of the peninsula, to the Pajaro River, near Watsonville, California. Elevations on the peninsula range from sea level to approximately 2,400 feet at Sierra Morena (all elevations presented relative to mean sea level [MSL]).

3.6.3.2 Geology

The San Francisco Bay region is located along the complex boundary margin between two tectonic plates: the North American Plate and the Pacific Plate. As a result, geologic conditions in the project area have been and continue to be primarily controlled by the interaction of these two massive blocks of the earth's crust. Under the current tectonic regime, the Pacific Plate moves northwestward relative to the North American Plate at a rate of about 5 centimeters per year (De Mets et al., 1990, 2010; Antonellis et al., 1999). Within the past several million years, a shift to slightly oblique movement between the two plates has led to formation of the northwest-oriented mountains of the Coast Ranges. Relative movement between the North American and Pacific Plates at the latitude of the San Francisco Bay region is accommodated by predominantly strike-slip motion along a number of major faults, including the San Andreas, San Gregorio, Hayward, and Calaveras faults. In addition to these, countless other faults in the region accommodate relative motion between major faults and relieve compressional stresses along the plate boundary.

For much of its length, the San Andreas Fault is the boundary between basement rocks of the Franciscan Complex and the Salinian Block. The Franciscan Complex is of Jurassic and Cretaceous age and consists of mafic and ultramafic basement rocks and sedimentary rocks that were deposited in a deep ocean environment and subsequently accreted to the western margin of the North American Plate. The Salinian Block is a continental block of Late Cretaceous granitic basement rock overlain by Cretaceous and Tertiary sedimentary and volcanic rocks. Basement rocks underlying the project area generally belong to the Franciscan Complex.

The San Francisco Bay, located within and east of the project area, occupies a Late Pliocene structural depression that has been flooded several times in response to Pleistocene glacial cycles. Sediment deposition within the basin now occupied by the Bay has been strongly influenced by ocean-level fluctuations. During periods of glacial

advance, sea levels were lower, leaving the basin dry and subject to alluvial deposition, stream channel erosion, and aeolian (wind-related) processes. During periods of glacial retreat, sea levels rose flooding the basin and resulting in fluvial deposition of fine-grained sediments at the bottom of the Bay. Flatlands, created by alluvial deposition of locally-derived sediments, are found between the Bay margins and the surrounding hills. Historical development around the Bay margins has included placement of artificial fill materials bayward of the natural shoreline, significantly altering the shoreline and reducing the size of the Bay.

3.6.3.3 Soils, Sediments and Rock Units

The soil units underlying proposed onshore project components are limited to reclaimed and cut and fill soils. Since the project is located in a dense urban area of San Francisco, some areas are also mapped as "urban land" without a separate soil classification (NRCS, 2011).

Prior to development of San Francisco, the historical Mission Bay was a shallow westward extension of San Francisco Bay, bounded by Potrero Hill to the south, Rincon Hill to the north, and alluvial plain and valleys of Mission Creek to the west. Much of Mission Bay was characterized by water depths of less than about 2 feet (with respect to mean low water level) and was bounded by extensive marshlands. Placement of fill across Mission Bay began in the latter part of the 19th century and continued into the early 20th century. Portions of Mission Bay were initially filled during the 1860s to 1880s. Some of the central portions of Mission Bay reportedly were filled with debris from the City following the 1906 earthquake and fire.

Boring logs and CPT soundings (B&V, 2012) show that the subsurface materials beneath the proposed cable route include six primary geologic units: Artificial Fill, Bay Mud, Colma Formation, Alluvium (some of which is younger than and overlies the Colma Formation material), Franciscan Complex, and Serpentinite. Each of these is described below; the codes in parentheses next to the unit name are assigned to the unit as set by the North American Commission on Stratigraphic Nomenclature; the Q indicates a Quarternary unit. Route-specific geologic information can be found in the feasibility study (B&V, 2012). See Figure 3.6-1 for a geologic site plan for the project and Figure 3.6-2 for a bathymetric map; both are derived from Exhibit G of the feasibility study.

Artificial Fill (Qaf)

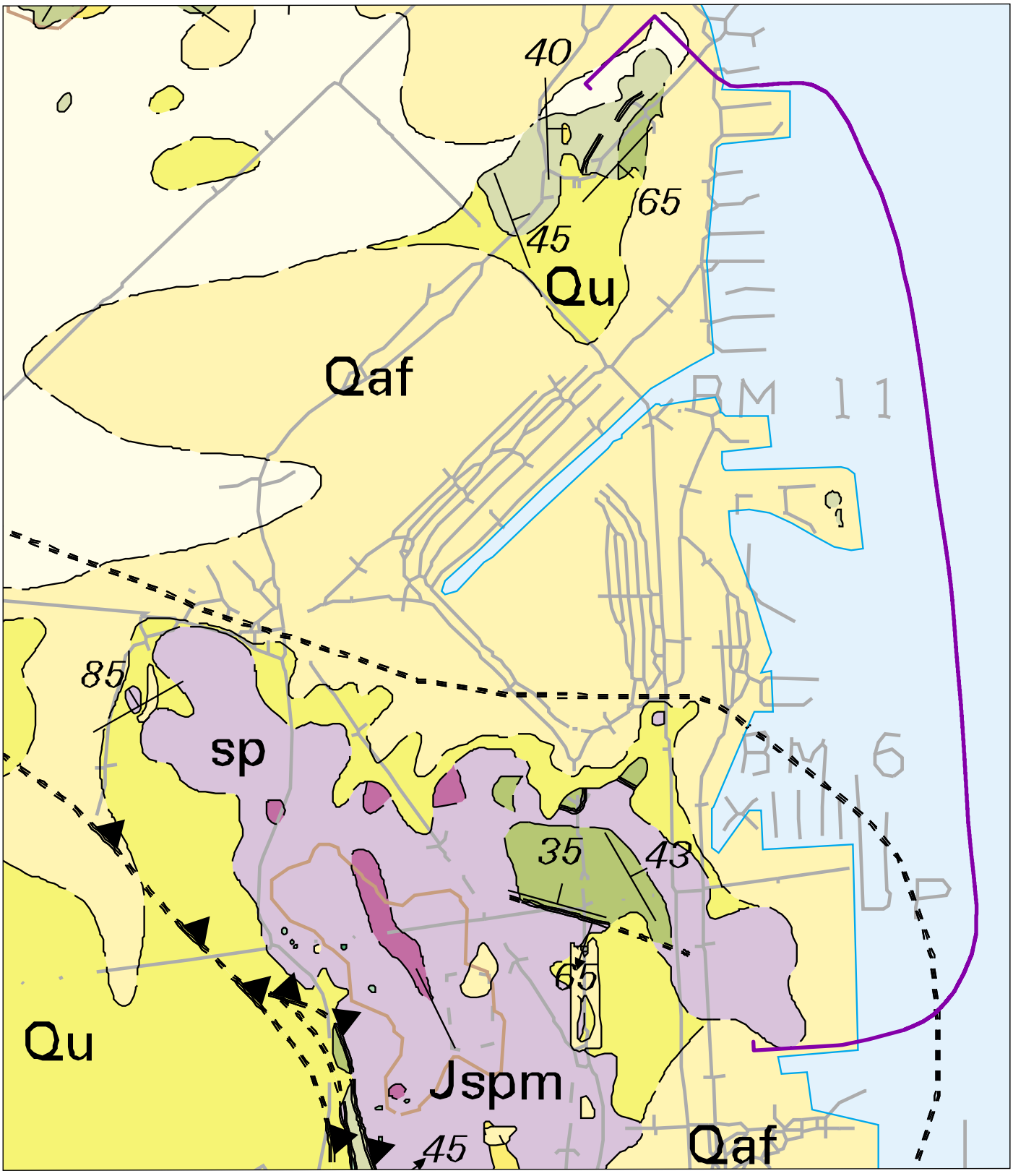
Artificial fill materials overlie much of the on-shore project area, with thicknesses ranging from 0 to about 30 feet. Properties and distribution of the emplaced fills vary greatly across the site. In general, the fills contain different proportions of sand and clay with locally increased amounts of gravel. Consistency of the clays range from soft to very stiff, and density of the sands range from very loose to medium dense. Man-made debris such as lumber, brick, and industrial slag materials are also present locally. Areas in which fill materials are thickest contain increased amounts of serpentinite rock, possibly sourced from excavations in the vicinity while the former Mission Bay was undergoing initial in-filling. Fill materials generally are present in minimal amounts around the flanks of Potrero and Rincon Hills, where bedrock is encountered in the relatively shallow subsurface.

Dune Sand (Qd)

Quaternary aeolian deposits underlie much of San Francisco and thicknesses ranges from 0 to 20 feet near the alignment. These deposits generally are comprised of fine to medium sands that are loose to medium dense, and colors are typically light gray to light brown.

Bay Mud (Qbm)

Holocene Bay Mud is commonly present below the fill in the on-shore portions, and on the floor of the San Francisco Bay where the submarine cable will be installed, and has a thickness that ranges from 0 to about 110 feet. Bay Mud consists of organic-rich, compressible silts and clays that have filled in irregularities in the bay basin and stream channels along the margins of the basin, and formed the mud flats that were prominent around its



Source: USGS, 2012.

North

0 0.25 0.5

Approximate scale in miles

LEGEND

- Qaf — Artificial fill (Quaternary)
- Qd — Dune sand (Quaternary)
- Qu — Undifferetiated surficial deposits (Quaternary)
- Kfs — Sandstone and shale (Cretaceous; Franciscan)
- Jspm — Massive serpentinite (Jurassic; Franciscan)
- sp — Serpentinite (Jurassic; Franciscan)
- Proposed Transmission Line

FIGURE 3.6-1
Geologic Site Plan
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

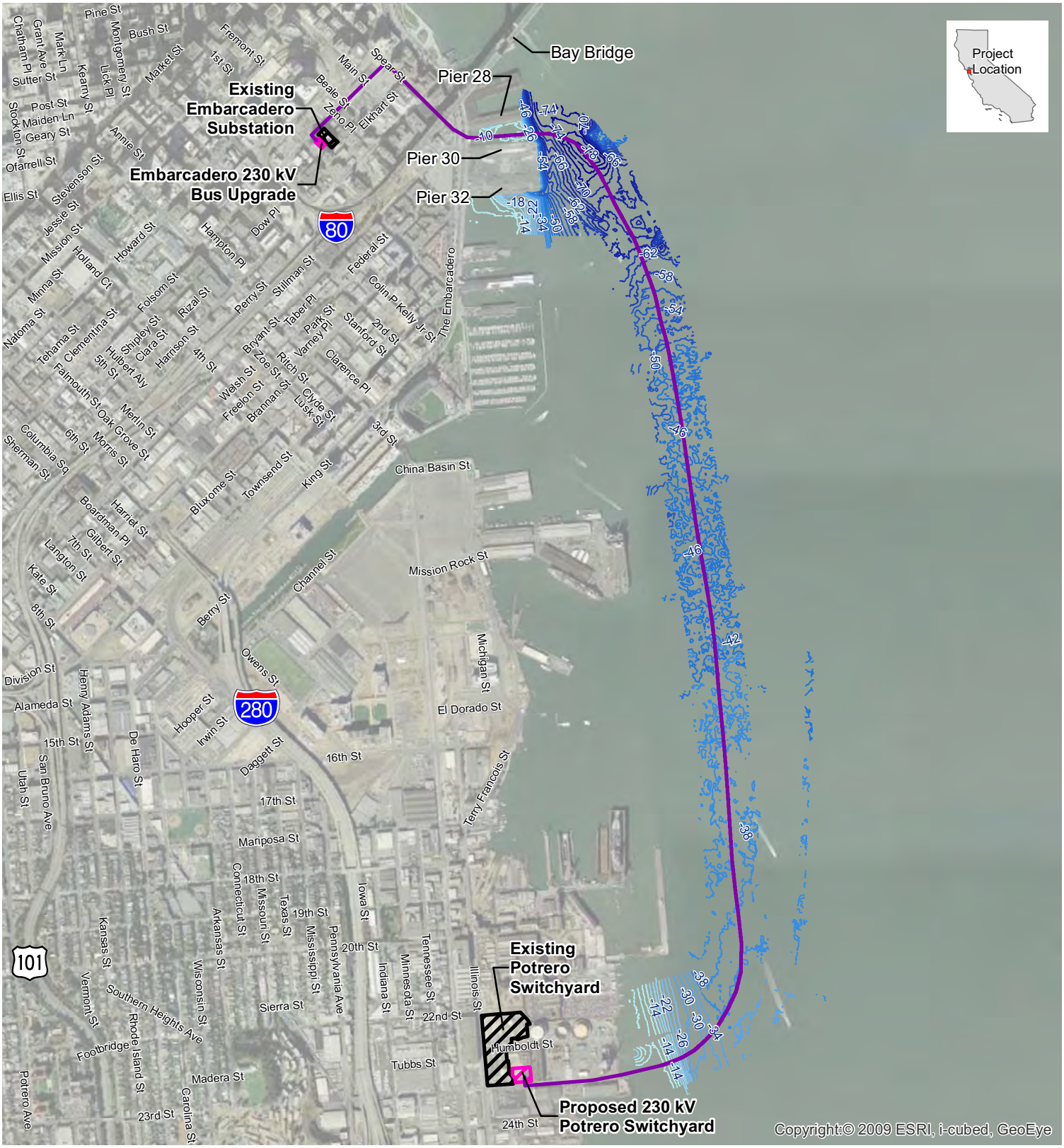


FIGURE 3.6-2
Water Depth
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

margin (Goldman, 1969). Bay Mud generally consists of very soft to soft clay and local silt with high plasticity, with local lenses of sand, shells, and peat. Bay Mud is typically dark gray to dark greenish gray, frequently with abundant organic debris such as leaves, wood fragments, rootlets, and shell fragments. Bedding is considered massive; however local lenses of sand are present commonly toward, or just below the base. Often the sandy units are considered to be transitional between Bay Mud and underlying Colma Formation or older alluvium.

Colma Formation (Qc)

Late Pleistocene Colma Formation deposits are commonly present below the Bay Mud in areas where the top of bedrock is more than about 60 feet below the ground surface (bgs) and have thicknesses ranging from 0 to 30 feet. The Colma Formation consists of fine sand deposited in a shallow marine environment during the last major interglacial period and sea-level highstand (about 120,000 to 80,000 years before present). The Colma Formation includes nearshore, valley fill, and dune deposits that are deposited on older alluvial deposits and the Franciscan Complex across the San Francisco Peninsula. The Colma Formation generally comprises well-sorted fine-grained sand ranging from medium dense to very dense. It is typically oxidized to dark yellowish brown with local reduced zones colored dark greenish gray. Increased amounts of clay are present locally.

Older Sediments/Alluvium (Qu)

Pleistocene alluvial deposits are commonly present below the Colma Formation and have variable thickness. The older alluvium is composed primarily of clay and sand in various proportions, with local minor amounts of gravel. The clays are very stiff, and the sands range from dense to very dense. Colors are typically olive and olive brown, but also include brown, dark gray, and greenish gray.

Serpentinite and Franciscan Formation Bedrock

Mesozoic serpentinite bedrock is encountered locally in the project area as a relatively thin structural layer on top of Franciscan Complex rock. The serpentinite is commonly soft and reduced to clay, and intensely sheared. The degree of weathering ranges from severe with extensive oxide staining, to locally fresh where the rock is hard with little clay development. Colors include light olive gray, olive gray, and grayish green. Calcite and quartz veins occur locally and are more abundant in harder rock. Resistant serpentinite is encountered within a foot of the ground surface in the northeastern portion of project area near Embarcadero Substation, and is encountered at depths greater than 90 feet elsewhere (B&V, 2012). Please see Section 3.8, Hazards and Hazardous Materials, for further discussion of construction in serpentine soils.

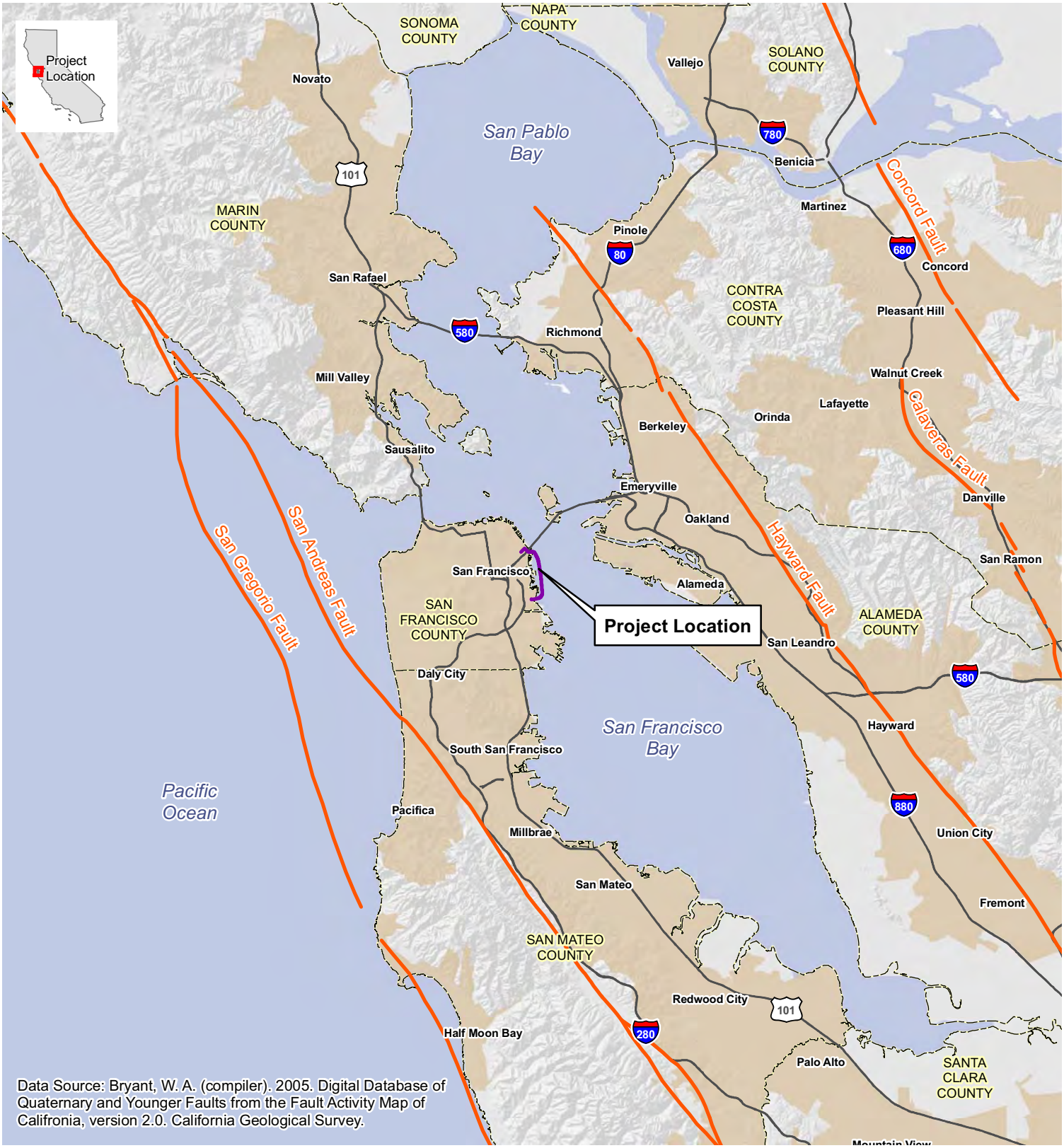
3.6.3.4 Seismicity

For the purposes of this report, multiple sources were used to identify faults within a distance of 30 miles that may potentially affect the site, including the USGS and CGS (USGS, 2000a-b; CGS, 2000a-c). A regional map of the fault zones in proximity to the site using data from a CGS source is included as Figure 3.6-3.

Fault System Classification

Project vicinity faults shown on Figure 3.6-3 are classified by age as Historic, Holocene, Late Quaternary, Quaternary, and Pre-Quaternary (Jennings and Bryant, 2010; Jennings, 1994) according to the following criteria:

- Historic: fault displacement has occurred within the past 200 years
- Holocene: shows evidence of fault displacement within the past 11,700 years, but without historic record
- Late Quaternary: shows evidence of fault displacement within the past 700,000 years, but may be younger due to a lack of overlying deposits that enable more accurate age estimates
- Quaternary: shows evidence of displacement sometime during the past 1.6 million years
- Pre-Quaternary: without recognized displacement during the past 1.6 million years



Data Source: Bryant, W. A. (compiler). 2005. Digital Database of Quaternary and Younger Faults from the Fault Activity Map of Califronia, version 2.0. California Geological Survey.

Proposed Transmission Line
Faults
Urban Area
County Boundary

N

Scale: 1:400,000

0 3 6 Miles

FIGURE 3.6-3
Fault Map
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

Faults of Quaternary age within the project vicinity are also described by one of two activity classes: "active" and "potentially active," as defined by the California State Mining and Geology Board (Hart and Bryant, 1997). "Active" describes Historic and Holocene faults that have had surface displacement within about the last 11,700 years. "Potentially active" describes faults showing evidence of surface displacement during Quaternary time (the past 1.6 million years). A fault is considered "inactive" if the most recent documented fault displacement pre-dates the Quaternary period. This classification is not meant to imply that inactive fault traces will not rupture, only that they have not been shown to have ruptured within the past 1.6 million years and that the probability of fault rupture is low.

Active and potentially-active faults within the project limits and immediate vicinity have been mapped and documented by a number of government agencies. The USGS and CGS have published numerous maps and reports on faults of various types, ages, and levels of activity. General agreement between sources was found for the location and activity of faults listed in Table 3.6-1, which presents information on active and potentially-active faults within approximately 30 miles of the project area.

Seismic Parameters

Earthquakes, their sources, and the effects of seismic ground motion are measured by a number of parameters, including magnitude, intensity, fault length and rupture area, design basis earthquake, and peak-ground acceleration (PGA). These seismic parameters are used to evaluate and compare earthquake events, seismic potential, and ground shaking. The seismic parameters presented and referenced in the text and tables of this chapter are defined as follows.

Magnitude: The magnitude, or size, of an earthquake is measured by a number of methods. Several of these, including the Richter (M_L), surface wave (M_s), and body wave (M_b) methods, evaluate the magnitude of an earthquake by measuring the amplitude of seismic waves as recorded by a seismograph. Due to the instrumental properties of seismographs, these methods provide inconsistent results above or below a certain range of magnitudes. A more robust measure of magnitude is moment magnitude, or M_W. Evaluation of M_W is based on the seismic moment of an earthquake, which can be described as the leverage of forces across the area of fault slip. Because it is directly related to the area of the fault ruptured during an earthquake, moment magnitude is a consistent measurement of size from the smallest to the largest events.

Intensity: Rather than a mechanical measure of source size, earthquake intensity is a subjective measurement of earthquake shaking on a local level. Because it is based on observed effects of ground shaking on people, structures, and the environment, intensity is a useful method for estimating the magnitude of earthquakes for which no instrumental data is available. Intensity can also be used to compare levels of seismic response between different sites for the same earthquake event.

Design Basis Earthquake: The design-basis seismic event is a Moment Magnitude (MW) 7.8 on the San Andreas Fault. Using four of the Next Generation Attenuation (NGA) Relationships (Abrahamson and Silva [2008], Boore and Atkinson [2008], Chiou and Youngs [2008], and Campbell and Bozorgnia [2008]), peak ground accelerations (PGAs) were calculated for the project. Because the proposed AZ-1 transmission cables will be lifeline utilities, the 84th percentile motions (i.e., 1-sigma, or 1 standard deviation above the median), were used this in the deformation analyses conducted as part of the feasibility study.

Attenuation: In an earthquake, sudden rupture or displacement along a fault releases energy in the form of seismic waves, which travel outward from the source. The amount of energy released by an earthquake is related to its magnitude. Seismic waves travel through the earth, causing displacements or movements of the ground, similar to ripples on a pond. As waves travel away from the source, their energy is both absorbed and spread over an increasingly larger area through a process called attenuation. The amount of acceleration, velocity, and displacement caused by the passage of seismic waves decreases with distance from the source through attenuation. Thus, both the distance from the seismic source and earthquake magnitude affect the amount of wave energy reaching a given location. A number of empirical attenuation models, which describe the relationship between the amplitude of ground motion, earthquake magnitude, and distance, have been

developed based on analysis of past earthquake motions. These models are used to estimate ground motions resulting from potential future earthquakes.

Acceleration: Acceleration is the rate of change of the velocity of particles within the ground or structures caused by the passage of seismic waves. The peak ground acceleration is the highest acceleration (expressed as a fraction of the acceleration due to gravity, 32 ft/sec^2 or 9.8 meters/sec^2) experienced at a site due to the passage of seismic waves. PGA is dependent on a number of parameters, including earthquake magnitude, distance from the seismic source, and local soil conditions. For this chapter, estimated PGAs were taken from the feasibility study (B&V 2012). Estimated PGAs presented in this chapter are for rock and shallow soil sites, which are the geologic types most susceptible to high levels of acceleration in the project area, and are based on the design basis earthquake magnitude and estimated distances from the project area.

Fault Systems

Alquist-Priolo Earthquake Fault Zones

The Alquist-Priolo Special Studies Zones Act, passed in 1972, requires the establishment of "earthquake fault zones" (formerly known as "special studies zones") along known active faults in California (CDMG, 1992). Strict regulations on development within these zones are enforced to reduce the potential for damage due to fault displacement. In order to qualify for "earthquake fault zone" status, faults must be "sufficiently active" and "well-defined." As a result, only faults or portions of faults with a relatively high potential for ground rupture are zoned, while other faults, which may meet only one of the "sufficiently active" and "well-defined" criteria, are not zoned. The potential for fault rupture, therefore, is not limited solely to faults or portions of faults delineated as "earthquake fault zones."

To meet requirements of the Alquist-Priolo Special Studies Zones Act, "earthquake fault zone" boundaries have generally been established approximately 500 feet on either side of major, active fault traces and approximately 200 to 300 feet on either side of well-defined, minor fault traces. Exceptions to this general pattern of "earthquake fault zone" delineation periodically occur where faults are obscured, poorly located, locally complex, and/or not vertical. Because of these criteria for determining zone boundaries, an "earthquake fault zone" designated by CGS for a particular fault may be wider than the actual fault zone occupied by traces of the fault. Conversely, due to specific zoning criteria, mapped fault traces not shown to be "sufficiently active" or "well-defined" may not be included within the designated Alquist-Priolo "earthquake fault zone." Therefore, in some cases the actual zone of potential surface rupture may not be entirely included within the CGS-designated "earthquake fault zone." The project is not in an Alquist-Priolo Fault Zone.

San Andreas Fault Zone

The San Andreas fault zone, extending approximately 600 miles from Mexico to the north coast of California, accommodates predominantly right-lateral movement between the Pacific and North American crustal plates. The stretch of the San Andreas fault zone located nearest to the project area is approximately 8 miles west/southwest under the Pacific Ocean. Rather than slipping along a single break in the Earth's surface, movement along the San Andreas fault typically occurs within a zone of multiple fractures. Where individual fractures within the fault zone are observed or inferred at the ground surface, they are mapped as fault traces. Where it is exposed, the zone of mapped faulting ranges from several hundred to several thousand feet wide.

Historical earthquakes along the Peninsula segment of the San Andreas fault zone in 1838 and 1906 resulted in surface rupture near the project area. Following the 1906 earthquake, measured ground deformations on the San Francisco Peninsula ranged from approximately 9 feet of right-lateral slip across a single fault trace to a total of approximately 17 feet of combined slip and ground distortion across the entire fault zone (Brabb and Olson, 1986). Analysis of ground-deformation data from locations near San Andreas Lake (located approximately 12 miles south/southwest of the project area) by Pacific Gas and Electric Company (PG&E, 1992) indicates that all significant ground deformation during the 1906 event occurred within approximately 450 feet of the main fault trace.

Because of its size and history of producing large, destructive earthquakes, the San Andreas fault is expected to largely control seismic design parameters for proposed project facilities. Earthquakes generated by other faults near the project vicinity contribute significantly to the potential for strong seismic ground shaking within the project area. Other large, active, and nearby faults posing seismic risk to project facilities include the San Gregorio, Hayward, and Calaveras faults. The San Gregorio fault is located approximately 11 miles southwest, the Hayward fault is located about 15 miles northeast, and the Calaveras fault is located about 25 miles east of the project area. The nearest faults of major historical significance are presented in Table 3.6-2.

TABLE 3.6-2
Active and Potentially Active Faults in the Project Vicinity
Embarcadero-Potrero 230 kV Transmission Project

Fault	Distance From Project Facilities [a] (miles)	Age [b]	Activity
San Andreas	8	Historic	Active
San Gregorio	11	Holocene	Active
Hayward	15	Historic	Active
Calaveras	25	Historic	Active

Notes:
[a] Distance is measured from mapped traces of the fault to the nearest facilities associated with the project
[b] From Jennings (1994)

Table 3.6-3 presents information on historical earthquakes on these and other regional faults, along with their approximate distances from the nearest point of the project.

TABLE 3.6-3
Significant Historic Earthquakes Affecting the Project Vicinity
Embarcadero-Potrero 230 kV Transmission Project

Date	Locality, Fault Name in parenthesis (if known)	Magnitude [a]	Approximate Distance from Project Area [b]	
			miles	Km
1989/10/17	Loma Prieta (San Andreas)	6.9	30	50
1984/04/24	Morgan Hill (Calaveras)	6.2	50	80
1957/03/22	Daly City (San Andreas)	5.3	8	< 8
1911/07/01	Calaveras Fault	6.5	40	65
1906/04/18	San Francisco (San Andreas)	7.8	0	0
1898/03/31	Mare Island	6 ½	30	50
1890/04/24	Pajaro Gap	6 ¼	50	80
1884/03/26	Santa Cruz Mountains	6	< 40	< 65
1870/02/17	Los Gatos	6	30	50
1868/10/21	Hayward Fault	7	15	25
1865/10/08	Southern Santa Cruz Mountains	6 ½	< 40	< 65
1864/02/26	Southern Santa Cruz Mountains	6	< 40	< 65
1858/11/26	San Jose Region (Mission?)	6 ¼	< 40	< 65
1856/02/15	San Francisco Peninsula	5 ¾	< 10	< 15
1838/06/--[c]	San Francisco Peninsula	7	0	0
1808/06/21	San Francisco Region	6[c]	--[c]	--[c]

TABLE 3.6-3
Significant Historic Earthquakes Affecting the Project Vicinity
Embarcadero-Potrero 230 kV Transmission Project

Date	Locality, Fault Name in parenthesis (if known)	Magnitude [a]	Approximate Distance from Project Area [b]	
			miles	Km

Notes:
[a] Magnitude is moment magnitude (M_W) for earthquakes after 1911. For earthquakes before 1911, magnitudes are estimated from observed shaking intensity.
[b] Distances are estimated from reported epicenter or extent of fault rupture for earthquakes after 1911. For earthquakes before 1911, distances are estimated from location of causative fault. If causative fault is unknown, distance is estimated from area of highest reported shaking intensity.
[c] Precise data is unavailable
Information from Andrews (1992), Oppenheimer and MacGregor-Scott (1992), and Ellsworth (1990).

Ground Motion

The deterministic PGAs shown in Table 3.6-4 were calculated for the project area based on a design-basis earthquake of 7.8 on the nearby San Andreas fault as part of the feasibility study (B&V, 2012), as defined above. Incorporating NGA Relationships, these PGAs are based on Site Class D (firm-ground) and E (soft clay) conditions offshore. For onshore alternatives, locations where bedrock was encountered at or near the surface were assigned to Site Class C (very dense soil and soft rock), locations where Bay Mud or other soft soils were encountered assigned to Site Class E, and locations where stiff or dense soils overlie bedrock that is not very near the ground surface, or locations where there is not sufficient information to interpret otherwise, a Site Class D was assigned (B&V, 2012).

TABLE 3.6-4
Estimated Peak Ground Acceleration in the Project Area
Embarcadero-Potrero 230 kV Transmission Project

Project Area	Median PGA Range (g)	84th Percentile PGA Range (g)
Submarine	0.26-0.29	0.41-0.48
Onshore	0.27-0.30	0.42-0.50

3.6.3.5 Landslides

Landslides occur when shear stresses within a soil or rock mass exceed the available shear strength of the mass. Impacts from landslides are not expected along the onshore or offshore portions of the proposed route or at Embarcadero Substation or Potrero Switchyard.

3.6.3.6 Liquefaction

Liquefaction is a phenomenon in which saturated, cohesionless soils such as sand and silt temporarily lose their strength and liquefy when subjected to dynamic forces such as intense and prolonged ground shaking. The vast majority of liquefaction hazards are associated with sandy soils and silty soils of low plasticity. In order to be susceptible to liquefaction, potentially liquefiable soils must be saturated or nearly saturated. In general, liquefaction hazards are most severe in saturated soils within the upper 50 feet of the ground surface. The potential for liquefaction increases with shallower groundwater.

Project area borehole observations as well as regional groundwater data from nearby wells indicate that the groundwater table along the onshore project alignment is expected to be between 6 and 15 feet below ground surface (bgs), with 10 feet BGS being typical (B&V, 2012). CGS (2000c) uses the highest known (historic) groundwater levels to evaluate liquefaction hazard because water levels during an earthquake cannot be anticipated due to unpredictable fluctuations caused by natural processes and human activities.

Hazard maps produced by the USGS (Knudsen et al., 1999; USGS, 2000) and the Association of Bay Area Governments (ABAG, 2011) depict liquefaction and lateral spreading hazards for the entire Bay Area in the event of a significant seismic event. According to these maps, some on-shore portions of the project site are in an area expected to have a high potential to experience liquefaction (see Figure 3.6-4). The submarine portion of the route is not highly susceptible to liquefaction.

3.6.4 Applicant-Proposed Measures and Potential Impacts

3.6.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, project impacts on geology and soils may be considered significant if the project will increase exposure of people or structures to major geologic hazards that result in substantial adverse effects, or the project has the potential to directly or indirectly impact a unique geological feature. Geologic impacts are typically considered less than significant if, through APMs including engineering, geotechnical investigation, and construction techniques, the risk of damage to structures can be greatly minimized, although not eliminated completely.

3.6.4.2 Applicant-Proposed Measures

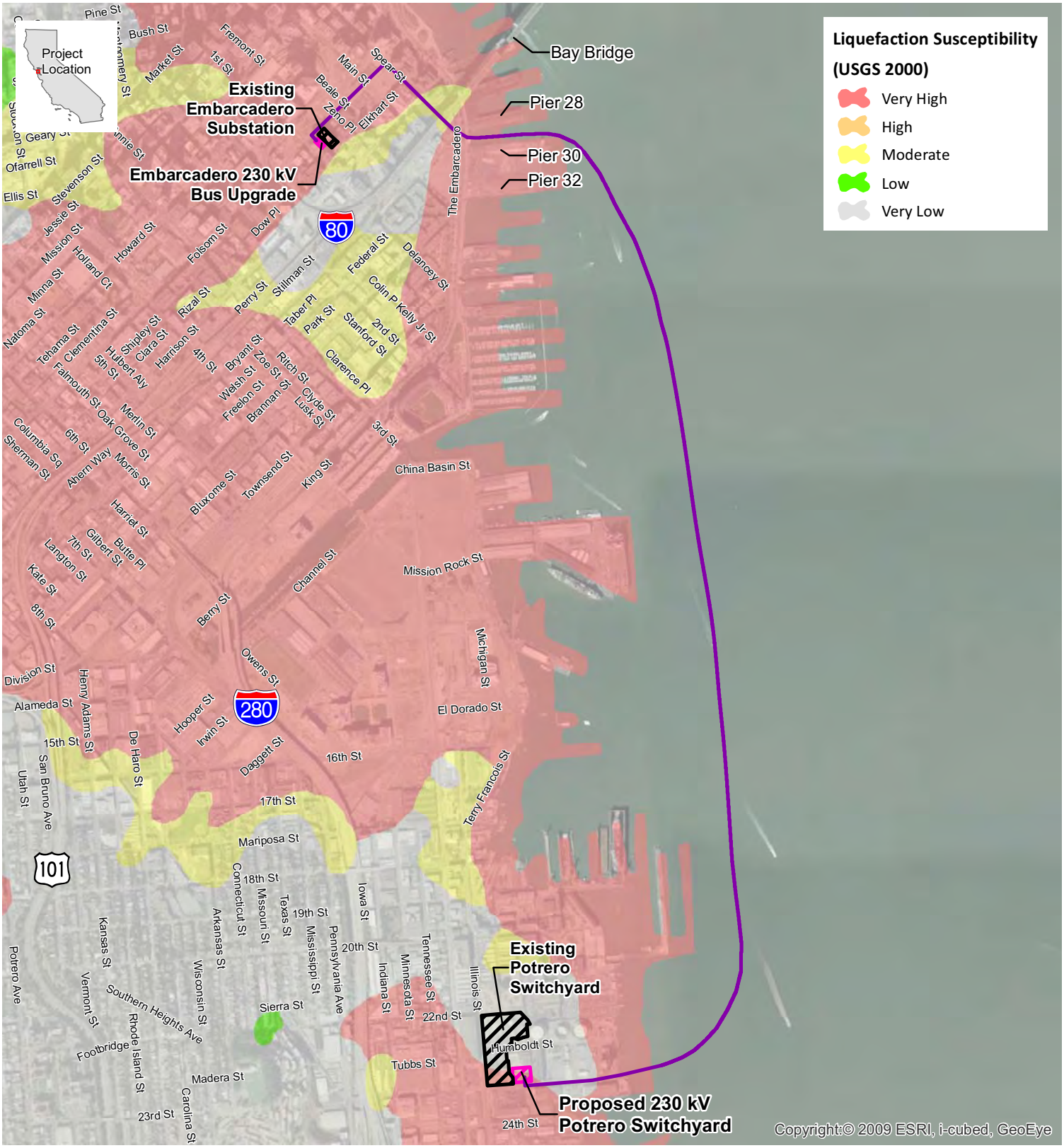
The following APMs include measures that are required by existing regulations and requirements or standard practices that will minimize or prevent any potential impacts, both during the construction and the operation and maintenance (O&M) phases of the project.

APM Geology and Soils (GS)-1: Appropriate soil stability design measures implementation. Based on available references, artificial fills, fine sands, silts, and bay mud are the primary soil types expected to be encountered in the excavated areas as project construction proceeds. Potentially problematic subsurface conditions may include soft or loose soils. Where soft, loose, or liquefiable soils are encountered during design studies or construction of the onshore portion of the route, appropriate measures will be implemented to avoid, accommodate, replace, or improve soft or loose soils and liquefaction hazards encountered during construction. Such measures may include the following:

- Locating construction staging and operations away from areas of soft and loose soil.
- Over-excavating soft or loose soils and replacing them with suitable non-expansive engineered fill.
- Increasing the density and strength of soft or loose soils through mechanical vibration and/or compaction.
- Treating soft or loose soils in place with binding or cementing agents.
- Construction activities in areas where soft or loose soils are encountered may be scheduled for the dry season, as necessary, to allow safe and reliable equipment access.
- Physical ground improvement such as in-situ soil mixing, drain piles, or sheet piles.
- Deepening of trench and/or the HDD to place the transmission line beneath liquefiable fills and/or potential for lateral spreading, where feasible.

APM GS-2: Appropriate seismic safety design measures implementation. As part of conceptual design investigation, site-specific seismic analyses were performed to evaluate PGAs for design of project components. Because the proposed transmission cables will be lifeline utilities, the 84th percentile motions (i.e., one standard deviation above the median; see Table 3.6-2), were used (B&V 2012). The project will be designed based on current seismic design practices and guidelines.

APM GS-3: Appropriate erosion-control measures implementation. Best Management Practices (BMPs) will be implemented to minimize and avoid surface runoff, erosion, and pollution (see APM WQ-1 and WQ-2).



Proposed Transmission Line

Substation/Switchyard

N

Scale: 1:20,000

0 1,000 2,000 Feet

FIGURE 3.6-4

Liquefaction Hazard

Embarcadero-Potrero 230 kV Transmission Project

San Francisco, CA

3.6.4.3 Construction and O&M Impacts

Project impacts on geology and soils were evaluated against the CEQA significance criteria, as summarized in Table 3.6-1 above. CEQA criteria for which no impact is expected are:

- **Fault rupture:** No known active faults underlie the site; therefore, there are no impacts associated with the potential rupture of a known fault.
- **Landslides:** Because of flat topography, there is no potential for landslides in the project area; therefore, no impact will occur due to landsliding
- **Expansive Soils:** Based on the available references, the project is not located in an area with expansive surficial soil; therefore, no impact will occur.
- **Soils incapable of adequately supporting waste water disposal systems:** The project type does not include a waste disposal system; therefore, no impact will occur.

The potential impacts associated with construction and O&M of the project are evaluated below. In all cases, the potential construction impacts will be reduced to "less than significant" with the implementation of the APMs discussed in Section 3.6.4.2.

a) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?
ii) Strong seismic ground shaking?
iii) Seismic-related ground failure, including liquefaction?
iv) Landslides?

i) Rupture of a known earthquake or ii) Strong seismic groundshaking? ***Less than Significant.*** Judging from the activity of major regional seismic sources (Table 3.6-2), it is likely that the project will be exposed to at least one moderate or greater earthquake during its operational life, and that the earthquake will be centered close enough to the project to produce strong ground shaking in the project area. The nearby San Andreas fault has produced numerous moderate to large earthquakes during historical time, including the 1906 San Francisco earthquake, and is a significant seismic source for future strong ground shaking within the project area. Accordingly, the design basis earthquake used for design of the project is a 7.8 magnitude earthquake on the San Andreas fault (roughly equivalent with the 1906 San Francisco earthquake), with ground shaking assumed at the 84th percentile.

In addition to the San Andreas, other active or potentially active faults within the project area that present significant potential for strong ground shaking within the region include the San Gregorio, Hayward, and Calaveras faults. Fault data for potential seismic sources in the project area are presented in Table 3.6-1 and PGAs are summarized in Table 3.6-4. Local soil conditions may amplify or dampen seismic waves as they travel from underlying bedrock to the ground surface. With the implementation of APMs GS-1 and GS-2, impacts would be less than significant.

iii) Seismic-related ground failure, including liquefaction? ***Less than significant.*** Soil liquefaction causes ground failure that can damage roads, pipelines, underground cables, and buildings with shallow foundations. Liquefaction can occur in areas characterized by water- saturated, cohesionless, granular materials at depths less than 40 feet (ABAG, 2003). In addition, liquefaction can occur in unconsolidated sediments or artificial fills located in the project area and other reclaimed areas along the margin of San Francisco Bay. The depth to groundwater influences the potential for liquefaction in this area, because sediments need to be saturated to have a potential for liquefaction (Helley and LaJoie, 1979). As discussed above and shown on Figure 3.6-2, some onshore portions of the project site are in areas expected to have a high potential to experience liquefaction

(ABAG, 2011). CGS has designated the project and surrounding area as a Seismic Hazard Zone (CGS 2000) for liquefaction potential.

Submarine Areas. The materials encountered along the marine corridor are clayey (e.g. Bay Mud) and therefore not highly susceptible to liquefaction. Liquefaction analysis indicates up to an inch or two of settlement associated with liquefaction-induced volumetric compaction and several tens of inches of lateral seismic deformation may be possible (B&V, 2012).

Onshore Areas. Artificial fill overlies Bay Mud within most of the project area as well as near the bay shore where the marine alignments transition from on-land to off-shore. Where these fills consist of sands or silty sands and are submerged, they are typically highly susceptible to liquefaction. The occasional sand lenses within the Bay Mud overlying the old alluvium may also be susceptible to liquefaction. Liquefaction-induced settlement is likely to be in the range of 6 to 12 inches, with an upper bound on the order of 18 inches (B&V, 2012).

APMs GS-1 and GS-2 listed above would reduce impacts due to liquefaction to a less-than-significant level.

iv) Landslides? ***No impact.*** No potential landslide areas exist along the routes and impacts from landslides are not expected along the onshore or offshore portions of the proposed route or at Embarcadero Substation or Potrero Switchyard.

b) Would the project result in substantial soil erosion or the loss of topsoil? ***Less-than-significant impact.***

The potential for increased erosion exists because of surface-disturbing activities associated with project construction**.** Erosion will be limited on land because the project site is relatively flat, and because the project will be buried in surface streets. The implementation of APM GS-3 will further ensure impacts from erosion will be less than significant.

For the submarine sections, offshore current-related scour can be a concern. However, the cable will be buried 5 to 10 feet below the surface of the sediments by hydroplow or other similar cable burying technique in which the sediments quickly resettle to backfill the trench. The hydroplow consists of a long blade mounted to either a sled or tire mounted submerged vehicle that is pulled along the seabed behind a cable laying ship (B&V, 2012). This cable laying method has considerably less environmental disturbance than traditional mechanical trenching methods and results in minimal potential for localized seafloor erosion.

c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse*? Less-than-significant impact.*

Mapped soils in the project area are primarily unconsolidated sands, silts, and Bay mud, which could be subject to subsidence. Appropriate design measures will be implemented to avoid, accommodate, replace, or improve any problematic soft or loose soils encountered during construction. The implementation of APM GS-1 will further reduce impacts from potentially soft or loose soils to less than significant. The project construction, operation, and maintenance do not include or require that groundwater wells be constructed for the purpose of water extraction and use, so the project will not result in any impact from subsidence associated with groundwater withdrawal.

The project construction, operation, and maintenance will not require that significant amounts of water be introduced into the subsurface soils; therefore, the project will have no additional impact on the liquefaction potential of the site.

d) Would the project be located on expansive soil, as defined in Section 1802.3.2 of the California Building Code (2007 or 2010) creating substantial risks to life or property?. ***No impact.***

Based on the available references, the project is not located in an area with expansive surficial soil; therefore, no impact will occur.

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? ***No impact.***

The project type does not include a waste disposal system; therefore, no impact will occur.

3.6.5 References

Antonelis, K., Johnson, D., Miller, M, and R. Palmer. 1999. "GPS determination of current Pacific-North American plate motion." *Geology* 27, p. 299-302.

Association of Bay Area Governments (ABAG). 2011. *The Real Dirt on Liquefaction – Appendix B, 2011 Supplement.*

Black & Veatch (B&V). 2012. *Embarcadero to Potrero ZA-1 230 kV Underground Transmission Project Feasibility Study*. Prepared for Pacific Gas and Electric Company. Final Draft. May.

Brabb, E.E., and J.A. Olson. 1986. Map Showing Faults and Earthquake Epicenters in San Mateo County, California. United States Geological Survey (USGS) Miscellaneous Investigations Series Map I-1257-F. Scale 1:62,500.

Brabb, E.E., and R.W. Graymer, and D.L. Jones. 1992. Fault Rupture Hazard Zones in California, Alquist-Priolo Special Studies Zones Act of 1972 with Index to Special Studies Zones Maps. California Division of Mines and Geology Special Publication 42, Revised 1992. State of California, Department of Conservation.

Bryant, W.A., and Hart, E.W. 2007. Fault-rupture hazard zones in California: California Geological Survey Special Publication 42, 42p. Online: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sp/Sp42.pdf.

California Geological Survey (CGS). 2000a. Digital Images of Official Maps of Alquist-Priolo Earthquake Fault Zones of California, Central Coast Region. DMG CD 2000-004, State of California, Department of Conservation.

California Geological Survey (CGS). 2000b. Map of Seismic Hazard Zones, City and County of San Francisco, Official Map Released November 17.

California Geological Survey (CGS). 2000c. Recommended criteria for delineating seismic hazard zones: California Division of Mines and Geology Special Publication 118, p. 12

City of San Francisco. 1997. *San Francisco General Plan: Community Safety Element.* August 11.

De Mets, C., R.G. Gordon, D.F. Argus, and S. Stein. 1990. "Current Plate Motions." *Geophysical Journal International*. Vol. 101. Pp. 425-478.

De Mets, C., Gordon, R.G, and D.F. Argus. 2010. Geologically current plate motions. Geophys. J. Int. 181, Pp 1–80.

Ellsworth, W.L. 1990. "Earthquake History 1769-1989." *The San Andreas Fault System, California*. R.E. Wallace, ed. United States Geological Survey. Professional Paper 1515. Chapter 6.

Goldman, H.B., ed. 1969. Geologic and engineering aspects of San Francisco Bay fill. CDMG Special Report Special Report 97.

Grant, P.W. and Perkins, W.J., 1994, Liquefaction hazard evaluation, Seattle, Washington: Proceedings.

Harding Lawson Associates, Dames & Moore, Kennedy/Jenks/Chilton, and EQE Engineering. 1991. *Final Report Liquefaction Study Marina District and Sullivan Marsh Area San Francisco, California.* Prepared for City and County of San Francisco, Department of Public Works. August 20.

Harding Lawson Associates, Dames & Moore, Kennedy/Jenks/Chilton, and EQE Engineering. 1992. *Final Report Liquefaction Study North Beach, Embarcadero Waterfront, South Beach, and Upper Mission Creek Area San Francisco, California*. Prepared for City and County of San Francisco, Department of Public Works. January 10.

Hart, E.W. and Bryant, W.A, 1997 (revised), Fault-rupture hazard zones in California: California Department of Conservation, Division of Mines and Geology Special Publication 42, p. 38

Helley, E.J., and Lajoie, K.R. 1979. Flatland deposits of the San Francisco Bay Region, California - Their geology and engineering properties, and their importance to comprehensive planning: United States Geological Survey Professional Paper 943.

Jennings, C.W. 1994. Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions. California Division of Mines and Geology (CDMG), Geologic Data Map No. 6, Map Scale 1:750,000.

Jennings, C.W., and Bryant, W.A., 2010, Fault activity map of California: California Geological Survey Geologic. Data Map No. 6, map scale 1:750,000.

Knudsen, K.L., J.S. Noller, J.M. Sowers, and W.R. Lettis. 1997. Quaternary Geology and Liquefaction Susceptibility Maps, San Francisco, California. 1:100,000 Quadrangle. United States Geological Survey (USGS), Open-File Report 97-715. scale 1:100,000.

Knudsen, K.L., J.M. Sowers, R.C Witter, C.M. Wentworth, and E.J. Helley. 2000. Preliminary Maps of Quaternary Deposits and Liquefaction Susceptibility, Nine-County San Francisco Bay Region, California: A Digital Database. United States Geological Survey (USGS), Open-File Report 00-444. scale 1:275,000.

Lawson, A.C. and others. 1908. The California earthquake of April 18, 1906: Report of the State Investigative Commission, Carnegie Institute, Washington, D.C.

Natural Resource Conservation Service (NRCS). 2011. Web Soil Survey (WSS). Soil Survey Area: San Mateo County, Eastern Part, and San Francisco County, California. Survey Area Data: Version 9, Jul 11, 2011. Date(s) aerial images were photographed: 6/12/2005. Online: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed on May 31, 2012.

Norris, Robert M. 1990. *Geology of California*. John Wiley and Sons, Inc.

O'Rouke, T.D., Bonneau, A.L., Pease, J.W., Shi, P., and Wang, Y. 2006. "Liquefaction and Ground Failures in San Francisco." *Earthquake Spectra* Vol. 22, No. S2, Pages S91-S112.

O'Rouke, T.D., and Pease, J.W. 1997. "Mapping Liquefiable Layer Thickness for Seismic Hazard Assessment." American Society of Civil Engineering. *Journal of Geotechnical and Geoenvironmental Engineering* vol. 123, no. 1, pp.46-56.

Pease, J. W., and O'Rourke, T. D. 1998. Liquefaction hazards in the Mission District and South of Market area, San Francisco. The Loma Prieta, California, Earthquake of October 17, 1989—Liquefaction: U.S. Geological Survey Professional Paper 1551-B, p. B25–B60.

Pacific Gas & Electric Company (PG&E). 1992. *Geologic Hazard Evaluations for Gas Transmission Lines 109 and 132 in San Bruno, California*. Prepared by the Pacific Gas and Electric Company Geosciences Department. November 1.

Schlocker, Julius. 1974. *Geology of the San Francisco North Quadrangle*. California: U.S. Geological Survey Professional Paper 782, 109 p.

Stover, C. W. and J. L. Coffman. 1993. *Seismicity of the United States, 1568-1989 (Revised).* U.S. Geological Survey Professional Paper 1527, United States Government Printing Office, Washington.

U.S. Geological Survey (USGS). 2000a. Preliminary Maps of Quaternary Deposits and Liquefaction Susceptibility, Nine-County San Francisco Bay Region, California: A Digital Database. Geology by Keith L. Knudsen, Janet M. Sowers, Robert C. Witter, Carl Ml Wentworth, and Edward J. Helley. Digital database by Carl M. Wentworth, Robert S. Nicholson, Heather M. Wright, and Katherine M. Brown. Open-File Report 00-444. Version 1.0.

U.S. Geological Survey (USGS). 2000b. Geologic map and map database of parts of Marin, San Francisco, Alameda, Contra Costa, and Sonoma Counties, California. Author: M.C. Blake, Jr., R.W. Graymer, and D.L. Jones. Digital database by: Adam Soule and R.W. Graymer. Miscellaneous Field Studies MF 2337, Online Version 1.0. Online: http://pubs.usgs.gov/mf/2000/2337/mf2337i.pdf. Last revised: 3/9/00.

3.7 Greenhouse Gas Emissions

3.7.1 Introduction

This section discusses the methodology, regulatory background, environmental setting, and potential climate change impacts associated with project construction and operation and maintenance. Although short-term emissions from project construction will result in some temporary impacts, the project will result in a less-than-significant impact to climate change. Because maintenance or repair activities associated with operation of the project are expected to be similar to current activities and because there will be minimal new sources of greenhouse gas (GHG) emissions, permanent climate change impacts from operation of the project will also be less than significant. Applicant-Proposed Measures (APMs) implemented as part of the project will further reduce these less-than-significant impacts (see Section 3.7.4.2). Potential impacts associated with criteria air pollutant emissions other than GHGs are discussed in Section 3.3, Air Quality.

Appendix G of the CEQA Guidelines presents significance criteria for evaluating potential project impacts related to GHG emissions (AEP, 2011). These significance criteria, along with the results of the impact analysis for GHG impacts (see Section 3.7.4.3 below), are summarized in Table 3.7-1.

TABLE 3.7-1
CEQA Checklist for Greenhouse Gas Emissions
Embarcadero-Potrero 230 kV Transmission Project

VII. GREENHOUSE GAS EMISSIONS **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less-than-Significant Impact**	**No Impact**
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑	☐
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☑

3.7.2 Regulatory Background and Methodology

The following subsections describe the regulatory background relevant to the project area as well as the methodology used to estimate GHG emissions from both construction and operation and maintenance activities.

3.7.2.1 Regulatory Background

Federal or Federal Delegated

On October 30, 2009, the United States Environmental Protection Agency (USEPA) published the Mandatory Reporting Rule (codified in 40 Code of Federal Regulations [CFR] Part 98) which requires mandatory reporting of GHG emissions from large sources and suppliers in the U.S. (USEPA, 2012b). In general, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, facilities that inject carbon dioxide (CO_2) underground, and facilities that emit 25,000 metric tons or more per year of CO_2-equivalent (CO_2e) emissions are required to submit annual reports to USEPA. USEPA reporting requirements continue to be updated.

On December 7, 2009, the USEPA Administrator signed two findings regarding GHGs. The first finds that the current and projected concentrations of the six key well-mixed GHGs in the atmosphere (CO_2, methane [CH_4], nitrous oxide [N_2O], hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF_6]) threaten the public health and welfare of current and future generations. The second finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare (USEPA, 2012b). While these findings do not themselves impose any requirements on industry or other entities, USEPA is developing vehicle emission standards under the Clean Air Act (CAA) as a result of these findings.

On June 3, 2010, USEPA promulgated the final GHG Tailoring Rule (75 Federal Register [FR] 31514). The GHG Tailoring Rule establishes clear applicability thresholds for stationary source emitters of GHGs under Prevention of Significant Deterioration (PSD) and Title V regulations. In general, any new stationary source with GHG emissions of 100,000 tons CO_2e per year or greater is now subject to both PSD review and the Title V program. Because there are no stationary sources of this magnitude associated with the project, PSD and Title V regulations will not apply to the project.

State or State Delegated

On June 1, 2005, then-Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this executive order is to reduce California's GHG emissions to year 2000 levels by 2010, 1990 levels by 2020, and 80 percent below the 1990 levels by 2050 (Office of the Governor, 2005). The California Environmental Protection Agency secretary will coordinate development and implementation of strategies to achieve the GHG reduction targets.

In 2006, the goal of Executive Order S-3-05 was reinforced with the passage of the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) by the California State Legislature. AB 32 provides the framework for regulating GHG emissions in California and requires the California Air Resources Board (CARB) to design and implement emission limits, regulations, and other measures such that statewide GHG emissions are reduced in a technologically feasible and cost-effective manner to 1990 levels by 2020. The statewide 2020 emissions limit is 427 million metric tons of CO_2e; CO_2 emissions account for approximately 90 percent of this value (CARB, 2007). No regulations have yet been adopted to implement the most aggressive statewide GHG emission target for 2050.

Part of CARB's direction under AB 32 was to develop a scoping plan that contains the main strategies California will use to reduce GHG emissions that cause climate change. The scoping plan includes a range of GHG reduction actions that include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program (CARB, 2008b).

In December 2007, CARB adopted the first regulation pursuant to AB 32 which requires mandatory reporting of GHG emissions from large emitting facilities, suppliers, and electricity providers. This regulation was significantly revised to better align with USEPA's Mandatory Reporting Rule; the revised regulation became effective January 1, 2012 (CARB, 2012b). CARB adopted the AB 32 Cost of Implementation Fee regulation on June 17, 2010 and the California Cap-and-Trade Program on October 20, 2011. Under the California Cap-and-Trade Program, covered entities will have an obligation to hold GHG allowances beginning in 2013 (CARB, 2012a). Recently, the Regulation for Reducing SF_6 Emissions from Gas Insulated Switchgear (CARB, 2012c) was implemented as part of AB 32. This regulation will be applicable to the project because Potrero Switchyard will include permanent installations of approximately seven SF_6-insulated circuit breakers subject to this regulation.

Senate Bill (SB) 97, enacted in 2007, required the development and adoption of amendments to the CEQA Guidelines addressing the analysis and mitigation of GHG emissions. Such amendments to the CEQA Guidelines became effective on March 18, 2010. The amended Guidelines state that each lead agency should make a good faith effort to describe, calculate or estimate GHG emissions, and when assessing significance of GHG impacts consider: a) the extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting, b) whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project, and c) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project (Office of Planning and Research [OPR], 2012). The Natural Resources Agency (NRA) developed a final statement of reasons explaining the legal and factual bases, intent, and purpose of the amendments to the CEQA Guidelines (NRA, 2009). Prior to these amendments, CARB published an interim guidance for assessing the significance of GHGs under CEQA in 2008, which indicates that GHG emissions for non-transportation-related sources of less than 7,000 metric tons of CO_2e per year should be presumed to have a less-than-significant-impact (CARB, 2008a).

As discussed in Section 3.3.2.1, the project is located within the jurisdiction of the Bay Area Air Quality Management District. The BAAQMD is the regional agency charged with preparing, adopting, and implementing emission control measures and standards for stationary sources of air pollution pursuant to delegated state and federal authority. Because the project will not involve construction of new stationary sources, there are no permitting regulations relevant to the project. The local plans and guidance documents referenced in Section 3.3.2.1, namely the BAAQMD's CEQA Air Quality Guidelines (BAAQMD, 1999; 2011; 2012) and the *Bay Area 2010 Clean Air Plan* (CAP; BAAQMD, 2010a), are relevant to analyses used to evaluate the project's GHG emissions.

3.7.2.2 Methodology

Short-term construction emissions of CO_2e were evaluated. Detailed construction emissions calculations are presented in Appendix A, including the assumptions employed. Construction emissions were estimated using construction equipment emission factors from the *California Emissions Estimator Model (CalEEMod) User's Guide* (Environ, 2011), vehicle emission factors from EMFAC2007 (version 2.3), and marine vessel emission factors from *AP-42* (USEPA, 1996).

Long-term operational emissions of CO_2e were also evaluated. These emissions are a result of leakage from SF_6-insulated circuit breakers. Detailed operation emissions calculations are also presented in Appendix A. Operational emissions associated with inspections and ongoing maintenance activities (primarily associated with periodic maintenance vehicle travel) were not estimated as these activities are part of PG&E's ongoing operations and are expected to be infrequent and minimal.

3.7.3 Environmental Setting

Regional

As discussed in Section 3.3.3, the project is located in San Francisco County within the San Francisco Bay Area Air Basin (SFBAAB). The characteristics of this air basin are fully described in Section 3.3.3.

The BAAQMD currently assesses a GHG emissions fee for permitted facilities under BAAQMD Regulation 3, Schedule T, but has no other GHG emissions regulations. The BAAQMD did, however, establish a climate protection program in 2005 to explicitly acknowledge the link between climate change and air quality. The BAAQMD regularly prepares inventories of criteria and air toxic pollutants to support planning, regulatory, and other programs. Similarly, the BAAQMD has prepared a GHG emissions inventory, based on the standards for criteria pollutant inventories, to support the BAAQMD's climate protection activities. Table 3.7-2 presents the 2007 GHG emissions inventory for the Bay Area, which is the most recently available inventory (BAAQMD, 2010b).

This GHG emissions inventory includes direct and indirect GHG emissions due to human activities. The emissions are estimated for industrial, commercial, transportation, residential, forestry, and agriculture activities in the SFBAAB. Both direct GHG emissions from locally generated electricity in the Bay Area and indirect emissions from out-of-region generated electricity for consumption in the region are reported. As shown in Table 3.7-2, fossil fuel consumption in the transportation sector was the single largest source of the SFBAAB's GHG emissions in 2007 (BAAQMD, 2010b).

CO_2 emissions in the Bay Area represented about 91.6 percent of total GHG emissions in 2007. These emissions are mainly associated with combustion of carbon-bearing fossil fuels such as gasoline, diesel, and natural gas used in mobile sources and energy-generation-related activities. Other activities that produce CO_2 emissions include oil refining processes, cement manufacturing, waste combustion, and waste and forest management. CH_4 emissions represented 2.6 percent of the total GHG emissions in 2007. Major sources of these emissions include landfills, natural gas distribution systems, agricultural activities, stationary and mobile fuel combustion, and gas and oil production fields. N_2O emissions represented 1.6 percent of the total GHG emissions in 2007. Major sources of these emissions include municipal wastewater treatment facilities, fuel combustion, and agricultural soil and manure management. Emissions from high global warming potential (GWP) gases, such as HFCs, PFCs, and SF_6, made up about 4.1 percent of the total GHG emissions in 2007. Major sources of these emissions include industrial processes such as semiconductor manufacturing, use as refrigerants and other products, and electric power transmission and distribution systems (BAAQMD, 2010b).

TABLE 3.7-2
Bay Area 2007 GHG Emissions Inventory
Embarcadero-Potrero 230 kV Transmission Project

End-Use Sector	Percent of Total Emissions	CO_2e Emissions (MMT/Year)
Industrial / Commercial	36.40	34.86
Residential Fuel Usage	7.12	6.82
Electricity / Co-Generation	15.87	15.20
Off-Road Equipment	3.05	2.92
Transportation	36.41	34.87
Agriculture / Farming	1.16	1.11
Total	**100**	**95.8**

Notes:
CO_2e = carbon dioxide equivalent; MMT/Year = million metric tons per year
Source: BAAQMD, 2010b

3.7.4 Applicant-Proposed Measures and Potential Impacts

3.7.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, impacts to climate change may be considered significant if the project:

- Generates GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and/or
- Conflicts with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHGs.

As discussed in Section 3.7.2.1, CARB developed statewide interim thresholds of significance for GHGs in 2008. For industrial projects, CARB proposed a quantitative threshold of 7,000 metric tons of CO_2e per year. This threshold of significance was used to evaluate the project's construction- and operational-related climate change impacts since there are no BAAQMD-recommended thresholds of significance for GHG emissions.

3.7.4.2 Applicant-Proposed Measures

To further reduce the less-than-significant impacts of the project, PG&E is proposing the two GHG-related APMs identified below. Although GHG emissions from the project are less than significant without mitigation, GHG reductions anticipated from implementation of these APMs have been quantified and are presented in Section 3.7.4.3.

APM GHG-1: Minimize Construction Exhaust Emissions. The following measures will be implemented during construction to further minimize the less-than-significant construction GHG emissions:

- Encourage construction workers to take public transportation to the project site where feasible.
- Minimize construction equipment exhaust by using low-emissions or electric construction equipment where feasible.
- Minimize unnecessary construction vehicle idling time. The ability to limit construction vehicle idling time is dependent upon the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times following start-up that limit their availability for use following start-up. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The project will apply a "common sense" approach to vehicle use, such that idling is reduced as far as possible below the maximum of five consecutive minutes required by California regulation (13 CCR 2485). If a vehicle is not required for use immediately or continuously for construction activities, its engine will be shut off.

- Minimize welding and cutting by using compression or mechanical applications where practical and within standards.
- Encourage use of natural gas or electric powered vehicles for passenger cars and light-duty trucks where feasible and available.
- Encourage the recycling of construction waste where feasible.

APM GHG-2: Avoid and Minimize Potential SF_6 Emissions. PG&E will include Potrero Switchyard in PG&E's system-wide SF_6 emission reduction program, which includes inventorying and monitoring system-wide SF_6 leakage rates and employing X-ray technology to inspect internal circuit breaker components to eliminate dismantling of breakers and reduce accidental releases. New circuit breakers installed at Potrero Switchyard and Embarcadero Substation will have a manufacturer's guaranteed SF_6 leakage rate of 0.5 percent per year or less and will be maintained in accordance with PG&E's maintenance guidelines.

In addition to these APMs, PG&E is implementing the following voluntary company-wide actions to further reduce GHG emissions:

- PG&E is an active member of the SF_6 Emission Reduction Partnership for Electric Power Systems, a voluntary program between the USEPA and electric power companies that focuses on reducing emissions of SF_6 from transmission and distribution operations. Since 1998, PG&E has reduced its SF_6 leakage rate by 89 percent and absolute SF_6 emissions by 83 percent.
- PG&E supports Natural Gas STAR, a program promoting the reduction of CH_4 from natural gas pipeline operations. Since 1998, PG&E has avoided the release of thousands of tons of CH_4.
- On April 24th, 2012, PG&E submitted a proposal to state regulators for a new clean energy program that would give its electric customers an opportunity to support 100 percent renewable energy for an average of a few dollars a month. If approved, the "Green Option" would be totally voluntary, and customers could enroll in and/or leave the program as they wish. If approved, PG&E will buy renewable energy certificates to match the portion of each participating electric customer's energy that is not already covered by PG&E's eligible renewable energy deliveries. PG&E is asking the California Public Utilities Commission to approve the Green Option by early 2013.

3.7.4.3 Potential Impacts

a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? ***Less-than-significant impact.***

GHG emissions directly generated during construction will result in a less-than-significant, short-term impact to climate change. GHG emissions will be further reduced with implementation of APM GHG-1. As shown in Table 3.7-3, the GHG emissions from the construction phase of the project, with or without APM GHG-1, are expected to be well below CARB's proposed threshold of 7,000 metric tons of CO_2e per year.

TABLE 3.7-3
GHG Emissions from Project Construction
Embarcadero-Potrero 230 kV Transmission Project

Construction Year	CO_2 Emissions (Metric Tons/Year) [c]	CO_2e Emissions (Metric Tons/Year) [c, d]
Without APM GHG-1		
Construction Year 2014 [a]	266	280
Construction Year 2015 [b]	585	614
With APM GHG-1 [e]		
Construction Year 2014 [a]	221	232
Construction Year 2015 [b]	498	523
CARB Significance Threshold	**7,000**	

Notes:
[a] Construction activities occurring in 2014 include Land Installation (Mobilization, Manholes, and Trenching) and HDD Drilling (HDD Send Pit Excavation, HDD Bore, Casing Fuse, and Pull In Casing) associated with the Submarine Route Cable Installation as well as Switchyard Construction (General Construction, Structure Foundation Excavation, Structure Delivery and Setup, and Cable Installation).
[b] Construction activities occurring in 2015 include Land Installation (Trenching and Cable Installation), HDD Drilling (HDD Send Pit Excavation, HDD Bore, Casing Fuse, Pull In Casing, and Restoration), and Off-Shore Installation associated with the Submarine Route Cable Installation as well as Switchyard Construction (General Construction, Cable Installation, and Cleaning and Landscaping).
[c] Emissions values rounded to whole numbers.
[d] Only CO_2 emission factors were available for all types of construction equipment utilized for this project. Emissions of CH_4 and N_2O from combustion sources are expected to be much lower than emissions of CO_2, contributing in the range of 2 to 4 percent of the total CO_2e emissions. Therefore, the CO_2 emissions were conservatively increased by 5 percent to calculate CO_2e emissions, accounting for the potential CH_4 and N_2O emissions associated with construction activities.
[e] To implement APM GHG-1, it is assumed that the hours of operation for all construction equipment, except the barge and tug boat used for only one hour each during the Pull In Casing Phase of the Submarine Route Cable Installation, will be reduced by 2 hours per day to minimize equipment idling time. The other reduction measures of APM GHG-1 (use of public transit, use of low emissions or electric construction equipment, use of natural gas or electric vehicles, limited use of welding and cutting, and increased use of recycling) were not quantified as their contributions to emissions reductions will depend on the extent of implementation, which is currently unknown.

As noted above, operational emissions associated with inspections and ongoing maintenance activities (primarily associated with periodic maintenance vehicle travel) will be negligible as these activities are part of PG&E's ongoing operations at Potrero Switchyard and Embarcadero Substation and are expected to be infrequent and minimal. However, installation of new circuit breakers at Potrero Switchyard may result in a very small increase of SF_6 emissions. These potential SF_6 emissions were estimated using a conservative leakage rate of one percent and are presented in Table 3.7-4. With implementation of APM GHG-2, which assumes a leakage rate of 0.5 percent, these less-than-significant potential SF_6 emissions would be further reduced. As shown in Table 3.7-4, the GHG emissions from the operation phase of the project, with or without APM GHG-2, are expected to be well below CARB's proposed threshold of 7,000 metric tons of CO_2e per year.

TABLE 3.7-4
GHG Emissions from Project Operation
Embarcadero-Potrero 230 kV Transmission Project

Applicable APM	Number of Circuit Breakers	Leakage Rate	SF_6 Emissions (metric tons/Year) [a]	CO_2e Emissions (metric tons/Year) [b]
Without APM GHG-2	7	1%	0.0056	132.80
With APM GHG-2		0.5%	0.0028	66.40
CARB Significance Threshold				7,000

Notes:
[a] Assumed each circuit breaker would contain 175 pounds of SF_6.
[b] A global warming potential of 23,900 was used to estimate CO_2e emissions per 40 CFR 98, Subpart A.

b) Would the project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases? *No impact.*

The project will not conflict with an applicable plan, policy, or regulation adopted to reduce GHG emissions. The minimal short-term construction GHG emissions will not interfere with the long-term goal of AB 32 to reduce GHG emissions to 1990 levels by 2020. Additionally, APM GHG-1 incorporates the use of public transportation and alternative fuels, which are control measures identified in the Bay Area 2010 CAP (BAAQMD, 2010a). Operation and maintenance of the project is assumed to be incorporated into existing PG&E activities such that GHG emissions from operation and maintenance activities are not anticipated to increase as a result of this project. While Potrero Switchyard circuit breakers may emit a minor amount of SF_6 due to leakage during project operations, these emissions will be tracked annually per CARB's Regulation for Reducing SF_6 Emissions from Gas Insulated Switchgear and will generate a minor and insignificant amount of CO_2e emissions. Therefore, the project will not conflict with plans, policies, or regulations intended to reduce GHGs.

3.7.5 References

Association of Environmental Professionals (AEP). 2011. *2011 California Environmental Quality Act (CEQA) Statute and Guidelines*. January.

Bay Area Air Quality Management District (BAAQMD). 1999. *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans.* December. Online: http://www.baaqmd.gov/Divisions/Planning-and-Research/Planning-Programs-and-Initiatives/~/media/8C1411130E9947DC939B618A43732FCF.ashx.

Bay Area Air Quality Management District (BAAQMD). 2010a. *Bay Area 2010 Clean Air Plan*. September.

Bay Area Air Quality Management District (BAAQMD). 2010b. *Source Inventory of Bay Area Greenhouse Gas Emissions*. February.

Bay Area Air Quality Management District (BAAQMD). 2011. *California Environmental Quality Act (CEQA) Air Quality Guidelines*. May.

Bay Area Air Quality Management District (BAAQMD). 2012. *California Environmental Quality Act Air Quality Guidelines*. Updated May 2012. Online: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx.

California Air Resources Board (CARB). 2007. *Staff Report: California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit*. November.

California Air Resources Board (CARB). 2008a. *Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act*. October.

California Air Resources Board (CARB). 2008b. *Climate Change Scoping Plan: A Framework for Change*. December.

California Air Resources Board (CARB). 2012a. "Cap-and-Trade Program" Web page. Online: http://arb.ca.gov/cc/capandtrade/capandtrade.htm. Accessed May 15, 2012.

California Air Resources Board (CARB). 2012b. "Mandatory Greenhouse Gas Emissions Reporting" Web page. Online: http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm. Accessed May 15, 2012.

California Air Resources Board (CARB). 2012c. "Sulfur Hexafluoride (SF_6) Emission Reductions from Gas Insulated Switchgear" Web page. Online: http://www.arb.ca.gov/cc/sf6elec/sf6elec.htm. Accessed August 3, 2012.

Environ International Corporation (Environ). 2011. *California Emissions Estimator Model (CalEEMod) User's Guide*. February.

Natural Resources Agency (NRA). 2009. *Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97*. December.

Office of Planning and Research (OPR). 2012. "CEQA and Climate Change" Web page. Online: http://www.opr.ca.gov/s_ceqaandclimatechange.php. Accessed May 15, 2012.

Office of the Governor. 2005. "Executive Order S-3-05" Web page. Online: http://gov38.ca.gov/index.php?/print-version/executive-order/1861/. Accessed November 1, 2011.

United States Environmental Protection Agency (USEPA). 1996. *AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors.* Chapter 3.3-4, Control Technologies. November.

United States Environmental Protection Agency (USEPA). 2012a. "Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act." Online: http://www.epa.gov/climatechange/endangerment/. Accessed May 15, 2012.

United States Environmental Protection Agency (USEPA). 2012b. "Greenhouse Gas Reporting Program" Web page. Online: http://www.epa.gov/climatechange/emissions/ghgrulemaking.html. Accessed May 15, 2012.

3.8 Hazards and Hazardous Materials

3.8.1 Introduction

This section discusses potential hazards, hazardous materials, and health and safety issues associated with the construction, operation, and maintenance of the project. Potential impacts were evaluated to determine their level of significance as provided under the CEQA Guidelines. The significance criteria, as set forth in CEQA Guidelines Appendix G, are summarized in Table 3.8-1. As summarized in the table and discussed in this section, all potential impacts related to hazards and hazardous materials are considered less than significant or nonexistent with implementation of the Applicant-Proposed Measures (APMs) described in Section 3.8.4.2.

TABLE 3.8-1
CEQA Checklist for Hazards and Hazardous Materials
Embarcadero-Potrero 230 kV Transmission Project

VIII. HAZARDS AND HAZARDOUS MATERIALS **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporation**	**Less than Significant Impact**	**No Impact**
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☑	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☑	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one quarter mile of an existing or proposed school?	☐	☐	☑	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☑	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☑

3.8.2 Regulatory Background and Methodology

3.8.2.1 Regulatory Background

The use of hazardous materials and disposal of hazardous waste are subject to numerous laws and regulations at all levels of government. Below is an overview of pertinent regulations.

Federal or Federal Delegated

Resource Conservation and Recovery Act (42 USC Section 6901 et seq.). Under the Resource Conservation and Recovery Act of 1976 (RCRA) individual states may implement their own hazardous waste programs in lieu of RCRA as long as the state program is at least as stringent as the federal RCRA requirements. The federal government approved California's RCRA program, called the Hazardous Waste Control Law (HWCL), in 1992.

Comprehensive Environmental Response, Compensation, and Liability Act (42 USC Chapter 103). The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and associated Superfund Amendments provide USEPA with the authority to identify hazardous sites, to require site remediation, and to recover the costs of site remediation from polluters. CERCLA also enabled the revision of the National Oil and Hazardous Substances Pollution Contingency Plan, also known as the National Contingency Plan (NCP, 40 CFR 300). The NCP provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants.

State or State Delegated

Hazardous Waste Control Law (HWCL). The HWCL authorizes the California Environmental Protection Agency (Cal/EPA) and the Department of Toxic Substances Control (DTSC), a department within Cal/EPA, to regulate the generation, transportation, treatment, storage, and disposal of hazardous wastes. DTSC can also delegate enforcement responsibilities to local jurisdictions that enter into agreements with DTSC for the generation, transport, and disposal of hazardous materials under the authority of HWCL.

Hazardous Substance Account Act (HSAA). The HSAA is California's equivalent to CERCLA. It addresses hazardous waste sites and apportions liability for them. The HSAA also provides that owners are responsible for the cleanup of such sites and the removal of toxic substances, where possible.

The two state agencies with primary responsibility for enforcing federal and state regulations related to hazardous material transport, and responding to hazardous materials transportation emergencies, are the California Highway Patrol (CHP) and California Department of Transportation (Caltrans), respectively.

Occupational Health and Safety CCR Title 8. The California Division of Occupational Safety and Health (Cal/OSHA) assumes primary responsibility for developing and enforcing workplace safety regulations within the state. Cal/OSHA standards are more stringent than federal Occupational Safety and Health Administration regulations and take precedence.

Hazardous Materials Management CCR Title 26. The California Office of Emergency Services is the state office responsible for establishing emergency response and spill notification plans related to hazardous materials accidents. Title 26 of the California Code of Regulations (CCR) is a compilation of those chapters or titles of the CCR that are applicable to hazardous materials management.

Porter-Cologne Water Quality Control Act. As discussed in more detail in Section 3.9, Hydrology and Water Quality, the Porter-Cologne Water Quality Control Act is the provision of the California Water Code that regulates water quality in California and authorizes the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards to implement and enforce the regulations. The project area is under the jurisdiction of the San Francisco Bay RWQCB.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program. The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) was mandated by the State of California in 1993. The Unified Program was created to consolidate, coordinate, and make consistent the administrative requirements, permits, inspections, and enforcement activities for six hazardous materials programs. The program has six elements:

- Hazardous Waste Generators and Hazardous Waste On-site Treatment
- Underground Storage Tanks
- Aboveground Petroleum Storage Act
- Hazardous Materials Release Response Plans and Inventories

- California Accidental Release Prevention
- Uniform Fire Code Hazardous Materials Management Plans and Hazardous Materials Inventory Statements

At the local level, this is accomplished by identifying a Certified Unified Program Agency (CUPA) that coordinates all of these activities to streamline the process for local businesses. The San Francisco Department of Public Health (SFDPH), Environmental Health Section is approved by Cal/EPA as the CUPA for the City and County of San Francisco.

Local

Because CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary regulations. The following analysis of local regulations relating to hazards and hazardous materials is provided for informational purposes and to assist with CEQA review.

Maher Ordinance. The 1986 Maher Ordinance No.258-86 (San Francisco Public Health Code 22A), as amended, requires an investigation of hazardous materials in soil at certain construction sites as a prerequisite for any building permit (San Francisco Public Works Code). The Maher Area encompasses the area of San Francisco bayward of a historic, pre-1906 earthquake high tide line (SFDPH, 2012). As discussed below, this area of San Francisco was largely created by landfill material where past industrial land uses and debris fill associated with the 1906 earthquake and Bay reclamation often left hazardous residue in local soils and groundwater. The Maher Ordinance was developed to protect workers and citizens from exposure to potential hazardous waste during project construction. The Maher Ordinance requires that, if more than 50 cubic yards of soil are to be disturbed and the project is on fill, or is at a location designated for investigation by the SFDPH, applicants for building permits must, among other things, analyze the site's soil for hazardous materials.

Although PG&E is not subject to local discretionary permitting for this project, ministerial permits that could trigger the Maher Ordinance such as a building permit for Potrero Switchyard will be secured, as required.

3.8.2.2 Methodology

The methodology for analyzing impacts from hazards and hazardous materials includes identifying general types of hazardous materials and activities used during project construction, operation, and maintenance. Potential impacts on the environment and public health from hazards and hazardous materials were further evaluated using information on the existing uses of the project site and adjacent properties, historical uses, and known contamination to determine the likelihood of encountering hazardous materials.

A report was obtained from Environmental Data Resources Inc. (EDR; EDR 2012) and reviewed to screen for hazardous waste sites in the proposed project area and two alternative onshore routes (see Section 5, Alternatives). The EDR report includes: 1) information on sites within 0.25 mile on either side of the project area that were identified in federal, state, and local databases related to hazardous materials and wastes; and 2) maps showing the locations of these sites. The database search process reviews multiple lists for historically contaminated properties and businesses that use, generate, or dispose of hazardous materials or petroleum products in their operation. In addition, the EDR search reviews lists of active contaminated sites that are currently undergoing monitoring and remediation.

As specified by CEQA significance criterion (see Table 3.8-1), the EDR report was used to identify sites along the routes that are included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 ("Cortese List"). Because the Cortese List is no longer specifically updated by the State, those requesting a copy of the Cortese "list" are now referred directly to the appropriate information resources contained on the Internet web sites of the boards or departments that are referenced in the statute. Therefore, the EDR report's listing of Cortese List sites was supplemented by reviewing the following:

- Sites listed on DTSC's Envirostor database (DTSC, 2012)
- Sites listed on the SWRCB's GeoTracker database (SWRCB, 2012)
- SWRCB lists of sites: 1) with reported waste constituents above hazardous waste levels outside the waste management unit; 2) with active Cease and Desist Orders and Cleanup and Abatement Orders for hazardous

wastes; or, 3) identified by DTSC as subject to corrective action pursuant to Section 25187.4 of the California Health and Safety Code (Cal/EPA, 2012)

The EDR report was also used to screen for nearby hazardous waste sites that could potentially affect the project based on the significance criteria summarized in Table 3.8-1.

The potential for activities and equipment that could pose fire hazards was evaluated through review of state fire hazard maps (California Department of Forestry and Fire Protection, 2007). Potential project related public safety issues associated with the use of hazardous materials, risk of property damage by wildfires, and an increase in accidents were identified through review of City of San Francisco land use documents (San Francisco Planning Department [SFPD], 2012).

3.8.3 Existing Setting

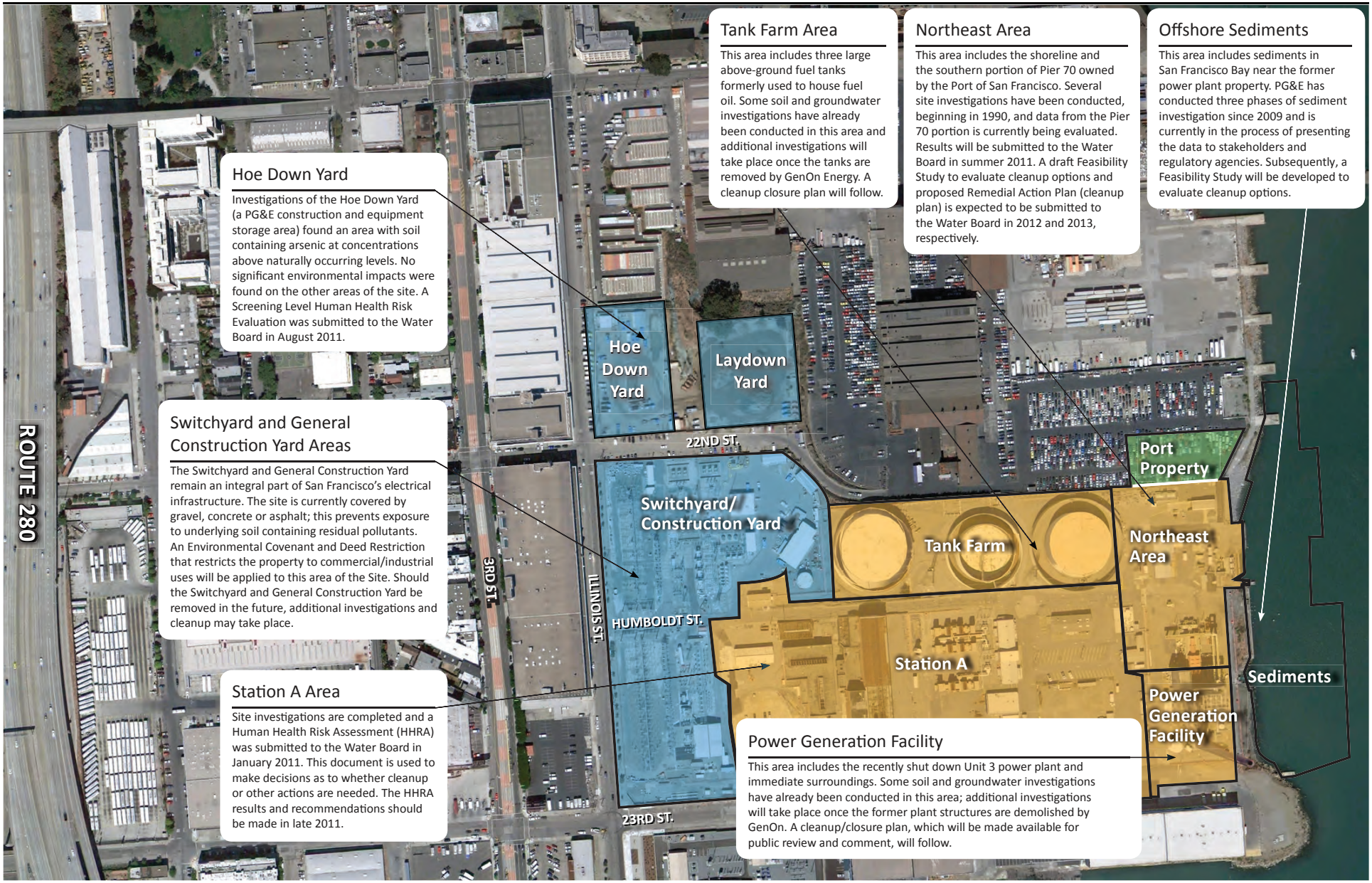
3.8.3.1 Environmental Setting

The project area is located in a highly urbanized area of San Francisco, and in the adjacent San Francisco Bay. The offshore segment of the preferred submarine route is approximately 2.5 miles long, extending from downtown San Francisco south to Potrero Switchyard. Land use along the northern end (where the transmission line comes onshore to connect with Embarcadero Substation) includes light industrial, residential, and high density mixed residential and commercial (SFPD, 2012). The southern end of this route (where the transmission line comes onshore to connect with Potrero Switchyard) is in an area zoned for heavy industrial use (SFPD, 2012).

The submarine route is located near known contaminated sediment areas (San Francisco Estuary Institute [SFEI] 2012), with contaminants including polynuclear aromatic hydrocarbons (PAHs), polybrominated diphenyl ethers (PBDEs), and polychlorinated biphenyls (PCBs). The near-shore landside segments of the project area, including the Mission Bay Redevelopment Area, are underlain by artificial fill materials (SFDPH, 2012). This artificial fill material is a heterogeneous combination of manmade debris, sand, silt and clay. In some cases, the fill material contains contaminants, including predominantly petroleum-based chemicals and heavy metals. The depth to groundwater in the project area near the shore reportedly ranges from 6 to 15 feet (Black & Veatch, 2012).

The EDR report (EDR, 2012) included many sites located along or within one-quarter mile of the proposed project route. Most of these are listed based on past or current hazardous materials use, hazardous waste generation, or the presence of petroleum hydrocarbon tanks, including both current and former tanks, aboveground and underground tanks, and tanks with and without reported leaks into the environment. Of those sites potentially along the proposed route, those identified as having recognized environmental conditions (ASTM, 2005) and included in the SWRCB's GeoTracker database are:

- Former PG&E Potrero Power Plant, currently owned by GenOn Energy, Eastern Portion of 1201 Illinois Street. The Former Potrero Manufactured Gas Plant (MGP) Remediation Site was divided into seven work areas to facilitate the remediation process; these areas include this eastern portion (4 work areas) owned by GenOn Energy, the western portion of which is owned by PG&E (2 work areas) (see next bullet) and a small parcel (1 work area) owned by the Port of San Francisco and located to the north of the GenOn Energy site (see Figure 3.8-1). The primary impacts at this site are associated with MGP residues. Most investigation activities have been completed in the accessible areas. Other remediation activities, including conducting feasibility studies, health risk assessments, and remedial action plans, are in various stages of completion (PG&E, 2011). Residues found at some MGP sites are comprised of many chemicals, including PAHs and volatile organic compounds (VOCs). Heavy metals have also been detected in soil, along with naturally occurring asbestos, both of which are known to be associated with fill material that includes serpentinite which is found in bedrock at the site and surrounding areas. Petroleum hydrocarbons have also been found in soil and groundwater. PG&E is in the process of investigation and remediation at this site, under oversight by the RWQCB (PG&E, 2011). The preparation of a Site Management Plan (SMP) for excavation of subsurface materials is being developed for the western portion (Station A area) of the GenOn Energy property (PG&E, personal communication, July 2012). The SMP is expected to be similar to the SMP approved for Potrero Switchyard, described below.



Source: PG&E, 2011.

LEGEND

- PG&E-Owned Properties
- GenOn-Owned Properties
- Port of San Francisco Property Impacted by Historical MGP Activities

North

Approximate boundaries shown. Map not to scale.

FIGURE 3.8-1
Potrero Site Map
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

- Potrero Switchyard, PG&E, Western Portion (Parcels 1 and 2) of 1201 Illinois Street. The primary impacts at the site are associated with MGP residues and are expected to be similar to those at the neighboring former power plant. A Covenant and Environmental Restriction on Property was filed by PG&E, signed by PG&E and the RWQCB, and recorded by the City and County of San Francisco in January 2012 (RWQCB, 2012). The Covenant includes an SMP that applies to subsurface work within the specified property boundaries. The SMP includes requirements that the RWQCB be notified of any excavation work involving more than 50 cubic yards of soil, and that any contaminated soil brought to the surface be managed in accordance with the SMP, in addition to applicable local, state, and federal laws (RWQCB, 2012). The SMP also includes requirements for notification of local agencies, implementation of dust control measures, sampling and analysis of soil and water removed from excavations, and provisions for reuse and disposal of excavation materials.
- Trans Bay Cable Converter Station Site, Harrigan Weidenmuller Company, 435, 525, and 555 23rd Street. This site is adjacent to the south of the former Potrero Power Plant. The site is impacted with heavy petroleum hydrocarbons, heavy metals, and PAHs in soil below a depth of 3 feet. A Covenant and Environmental Restriction on Property was filed by the owner, signed by the owner and RWQCB, and recorded by the City and County of San Francisco in January 2011 (RWQCB, 2011). This document requires adherence to a site-specific Risk Management Plan (RMP) and SMP for all soil disturbances (RWQCB, 2011). The project does not include work within this site.

In addition to these known conditions at the southern land segment of the project, the EDR report identifies a number of sites along the project route which, when considered as a whole, indicate that soil and groundwater along the entire route may contain hazardous substances and petroleum products present in fill materials and as a result of releases primarily from former underground fuel tanks and former manufactured gas plants (EDR, 2012; SWRCB, 2012). Where the results of the soil and groundwater characterization study (APM HM-5) indicate that hazardous substances and petroleum products are present in the soil and groundwater beyond the specified boundaries of existing SMPs, construction practices will be implemented consistent with SMP requirements for the adjacent site.

No public airports or private airstrips are within 2 miles of the project site (Google Maps, accessed May 17, 2012).

3.8.4 Applicant-Proposed Measures and Potential Impacts

3.8.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines (CCR, 2011), impacts related to hazards and hazardous materials may be considered significant if the project will create a significant hazard to the public or environment through transport, use, disposal, or accidental release of hazardous materials; emit hazardous emissions or handle hazardous substances within one quarter mile of an existing or proposed school; result in a safety hazard for people working or living in the vicinity of an airport or private airstrip; interfere with an adopted emergency response plan or emergency evacuation plan; or present significant risks involving wildland fires.

3.8.4.2 Applicant-Proposed Measures

As noted below, many of the APMs identified for potential impacts related to hazards and hazardous materials overlap with those identified for protecting water quality (see Section 3.9.4). All APMs listed below apply to the construction phase; APMs Hazards and Hazardous Materials (HM)-1 and HM-2 also apply to the operation and maintenance (O&M) phases of the project.

APM Hazardous Materials (HM)-1 (also see APM WQ-1 and APM WQ-3 in Section 3.9.4.2): Implementation of Hazardous Material and Emergency Response Procedures. PG&E will implement construction controls, training and communication to minimize the potential exposure of the public and site workers to potential hazardous materials during all phases of project construction.

These construction practices include construction worker training appropriate to the site worker's role (see APM HM-3), and containment and spill control practices in accordance with the Stormwater Pollution Prevention Plan (see APM WQ-1). If it is necessary to store chemicals, they will be managed in accordance with all applicable regulations. Material safety data sheets will be maintained and kept available on site, as applicable.

Soil that is suspected of being contaminated (on the basis of existing analytical data or visual, olfactory, or other evidence) and is removed during trenching or excavation activities will be segregated, tested, and if contaminated above hazardous levels, will be contained and disposed of offsite at a licensed waste facility. The presence of known or suspected contaminated soil will require testing and investigation procedures to be supervised by a qualified person, as appropriate, to meet state and federal regulations.

All hazardous materials and hazardous wastes will be handled, stored, and disposed of in accordance with all applicable regulations, by personnel qualified to handle hazardous materials. Practices during construction will include, but not be limited to, the following:

- Proper disposal of potentially contaminated materials.
- Site-specific buffers for construction vehicles and equipment located near sensitive resources/receptors.
- Emergency response and reporting procedures to address any potential hazardous material spills as described in Section 3.9, Hydrology and Water Quality.
- Stopping work at that location and contacting the CUPA (SFDPH Environmental Health Section; see Section 3.8.2.1 above) immediately if unanticipated visual evidence of potential contamination or chemical odors are detected. Work will be resumed at this location after any necessary consultation and approval by the CUPA or other entities as specified by the CUPA.

For the O&M phase of the project, existing operational hazardous substance control and emergency response plans will be updated as appropriate to incorporate necessary modifications resulting from this project.

APM HM-2: Development and Implementation of a Health and Safety Plan. PG&E will prepare a project-specific health and safety (H&S) plan prior to project construction. The purpose of the plan is to minimize potential safety hazards to site construction workers. The H&S plan will outline the project team H&S responsibilities; present job safety analyses, H&S procedures, and personal protective equipment requirements; establish worker training and monitoring requirements; and describe emergency response procedures relevant to project activities. Each contractor will be responsible for preparing and submitting to PG&E their own H&S Plan specific to their activities using the PG&E Plan for project-specific information.

For the O&M phase of the project, existing H&S plans for Potrero Switchyard and Embarcadero Substation will be modified and adhered to as appropriate.

APM HM-3: Adherence to Applicable Site-specific RMPs and SMPs. In addition to following its own project-specific procedures during the construction phase, PG&E will adhere to any applicable site-specific plans such as the SMP for the former Potrero Power Plant (see Section 3.8.3.1), as well as the Maher Ordinance (see Section 3.8.2.1).

APM HM-4 (also see APM WQ-4). Emergency Spill Supplies and Equipment. Oil-absorbent material, tarps, and storage drums will be available on the project site during construction and used to contain and control any minor releases of oil. In the event that excess water and liquid concrete escapes during pouring, it will be directed to lined and bermed areas adjacent to the borings, where the water will evaporate and the concrete will begin to set. Once the excess concrete has been allowed to set, it will be removed and transported for disposal, according to applicable regulations.

APM HM-5 (also see APM WQ-5). Soil, Groundwater, and Underground Tank Characterization. In areas where existing data are not available, soil and groundwater sampling and potholing will be conducted in onshore project areas before construction begins. Appropriate handling, transportation, and disposal locations will be determined based on results of the analyses performed on soil and groundwater. In addition, results will be provided to contractor and construction crews to inform them about soil and groundwater conditions and potential hazards. The location, distribution, and/or frequency of the borings will give adequate representation of the conditions in the construction area.

If suspected hazardous substances are unexpectedly encountered during trenching or other construction activities (using indicators such as sheen, odor, soil discoloration), work will be stopped until the material or tank is

properly characterized and appropriate measures are taken to protect human health and the environment. Appropriate personal protective equipment will be used and waste management will be performed in accordance with applicable regulations. If excavation of hazardous materials is required, the materials will be disposed of in accordance with applicable regulations. If necessary, groundwater will be collected during construction, contained, and disposed of in accordance with all applicable regulations.

If underground or aboveground storage tanks are found to be located along the project route and the route cannot be adjusted to avoid disturbance, the tanks will be removed prior to project construction. If it is determined that removal and disposal of tanks is necessary, a separate workplan describing the proper decommissioning and removal of the tanks and removal of any associated impacted soil will be prepared prior to removal.

APM HM-6 (also see APM WQ-6 and APM WQ-7). Horizontal Directional Drilling (HDD) drilling fluid and cuttings monitoring and management. HDD operations will include provisions for monitoring for loss of drilling fluids. Spill response measures shall include reducing fluid pressures and thickening the fluid mixture. Both the drilling technique and early detection and response shall be used to minimize release of fluids to the environment. A Frac-out Plan will be developed and prepared based on site specific conditions and specific contractor methods and equipment.

APM HM-7 (also see APM WQ-8). Sediment Testing Program for Submarine Cable Installation. As discussed above, sediments along the submarine cable route are located near known contaminated sediment areas (SFEI, 2012), and a Sampling and Analysis Plan will be prepared in coordination with the Dredged Material Management Office (DMMO) of the U.S. Army Corps of Engineers. Sediment sampling shall be performed at the locations where the HDD emerges into the Bay, and the results would be considered and addressed prior to commencement of construction near these locations. Potential contaminants such as PAHs and heavy metals are generally insoluble or have low solubility in water. Conducting sediment analysis of samples before the installation of the submarine cable will establish baseline conditions along the project route. The sediment testing program will be used to develop appropriate construction control measures that may include controlling turbidity during construction through adjustment of hydroplow jet controls and flows, turbidity monitoring during construction in certain areas, and appropriate handling and disposal of any sediment that may be removed as part of the submarine transitions to HDD installation.

3.8.4.3 Construction and Operation and Maintenance Impacts

Project impacts related to hazards and hazardous materials were evaluated against the CEQA significance criteria, as summarized above in Table 3.8-1.

a) Will the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? ***Less-than-significant impact.***

Construction

Other than substances associated with construction vehicles and equipment, no hazardous materials are associated with the routine activities of project construction. The impacts of potentially hazardous materials on the environment or exposure of the public and site workers to potentially hazardous materials routinely transported, used, or disposed of during project construction are less than significant with implementation of APMs HM-1 and HM-2 for all segments of the project; APM HM-3, HM-4 and HM-5 for the onshore and transitional segments; APM HM-6 for the transitional segments; and APM HM-7 for the submarine segment.

Operation and Maintenance

Other than substances associated with the new switchyard at Potrero such as lubricating and cooling oils, and with motor vehicles that will be used for line inspection, no hazardous materials are associated with maintenance and operation of the project. As described under APMs HM-1 and HM-2, existing PG&E operation and maintenance policies to address hazardous materials use will be updated prior to completion of project construction. These operation and maintenance policies will minimize the possibility of significant hazard to the public or the environment through routine activities; therefore, any impact will be less than significant. As

discussed in the Hydrology and Water Quality section, the Spill Prevention, Control, and Countermeasures (SPCC) Plan for Potrero Switchyard will be updated or a separate SPCC Plan prepared for the new switchyard.

b) Will the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? ***Less-than-significant impact.***

Construction

Project construction will require the use of motorized heavy equipment, including trucks and boats. During construction activities, there is an increased potential for an accidental release of fluids from a vehicle or motorized piece of equipment. Any impacts associated with such an accidental release will be reduced to a less-than-significant level by implementation of APMs HM-1 and HM-2 for all segments of the project, APM HM-4 for the onshore and transitional segments, and APM HM-6 for the two transitional segments. If underground tanks, contaminated soil or sediment, or contaminated water are encountered during project construction, any impacts will be less than significant with implementation of APMs HM-3 and HM-5 for the onshore segments of the project, and APM HM-7 for the submarine segment.

Marine vessels are required to operate under the U.S. Coast Guard regulations for oil spill response, and although a collision could result in a spill, the likelihood is low with implementation of the Marine Vessel Safety Zone that will be established as described in Section 3.16, Traffic and Transportation.

Operation and Maintenance

As described under APMs HM-1 and HM-2, existing PG&E operation and maintenance policies to address the potential release of hazardous materials in upset or accident conditions will be updated prior to completion of project construction.

c) Will the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one quarter mile of an existing or proposed school? ***Less-than-significant impact.***

Three schools are located within 0.25 mile of the northern end of the project underground route (see Section 3.10, Land Use and Planning). Construction impacts would be associated with the use of equipment with hydraulic fluids and fuels that could create a hazard in the event of a spill. However, APMs listed above would reduce that potential impact. No acutely hazardous materials or waste would be used or would be generated by the project.

d) Will the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? ***Less-than-significant impact.***

The EDR report and other available information indicate that the southern end of the project location may be on sites listed pursuant to Section 65962.5. These sites include the GenOn property on the eastern portion of 1201 Illinois Street (former PG&E Potrero Power Plant), the PG&E Switchyard on the western portion of 1201 Illinois Street, and the Trans Bay Converter Station on the southern side of 23rd Street. Although the PG&E Switchyard and the Trans Bay Cable Converter sites are considered closed by the RWQCB, both sites have a deed restriction and requirement for implementation of their respective Site Management Plans for projects that include disturbance of the subsurface soil. Implementation of APMs HM-3 and HM-5 will ensure that project activities will have less-than-significant impacts. The operations and maintenance associated with the project generally will not include disturbance of subsurface materials; however, if maintenance activities in the future include disturbance of soil and/or groundwater then the soil management plan and other policies in place will be followed as directed by the RWQCB or other regulatory agency.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? ***No impact.*** The project area is not within an airport land use plan nor within two miles of an airport; therefore, no impact will occur.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? ***No impact.*** The project area is not in the vicinity of a private airstrip; therefore, no impact will occur.

g) Will the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? ***No impact.*** If road closures are necessary during construction or O&M, these will be coordinated as described in Section 3.16, Traffic and Transportation. Such road closures will follow applicable regulations and will not impede emergency response. The project will not impair the implementation of or physically interfere with an adopted emergency response or evacuation plan; therefore, no impact will occur.

h) Will the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? ***No impact.*** There are no wildlands in the vicinity of the project and the project area does not lie within a fire hazard zone; therefore, no impact will occur.

3.8.5 References

American Society for Testing and Materials (ASTM). 2005. Standard of Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, E1527-05.

Black & Veatch (B&V). 2012. Embarcadero to Potrero ZA-1 230kV Underground Transmission Project Feasibility Study. Prepared for Pacific Gas and Electric Company. May.

California Code of Regulations (CCR). 2011. *Guidelines for Implementation of the California Environmental Quality Act. Preliminary Review of Projects and Conduct of Initial Study.* Title 14, Division 6, Chapter 3, Article 5, as amended through 2011.

California Department of Forestry and Fire Protection. 2007. Fire and Resource Assessment Program (FRAP) Draft Fire Hazard Severity Zones in LRA, San Francisco. October 5.

California Department of Toxic Substances Control (DTSC). 1996. *Notice of Restrictions. Assessors Block 3759, Lot 9 and Lot 14, San Francisco, CA*. Recorded February 20.

California Department of Toxic Substances Control (DTSC). 2012. Envirostor. Online: http://www.envirostor.dtsc.ca.gov/public. Accessed on May 14, 18, and 24, 2012.

California Environmental Protection Agency (Cal/EPA). 2012. Cortese List Data Resources. http://www.calepa.ca.gov/sitecleanup/corteselist/default.htm. Accessed on May 21, 2012.

California State Water Quality Control Board (SWRCB) 2012. GeoTracker. Online: http://geotracker.waterboards.ca.gov/. Accessed on May 14 and 25, 2012.

Environmental Data Resources, Inc. (EDR). 2012. *EDR DataMap™ Environmental Atlas™ Embarcadero-Potrero 230 kV Line, San Francisco, CA.* Inquiry Number: 3320194.1s. May.

Pacific Gas & Electric Company (PG&E). 2011. Fact Sheet, Former Potrero Power Plant Environmental Investigation and Cleanup Activities. September.

San Francisco Bay Regional Water Quality Control Board (RWQCB). 2012. *Covenant and Environmental Restriction on Property, Potrero Switchyard and General Construction Yard, 1201 Illinois Street, San Francisco, California.* Recorded January 5.

San Francisco Bay Regional Water Quality Control Board (RWQCB). 2011. *Covenant and Environmental Restriction on Property, 435, 525, 555 Twenty-Third Street, San Francisco, California.* Recorded January 8.

San Francisco Estuary Institute (SFEI). 2012. CD3 Contaminant Display and Download. http://www.sfei.org/tools/wqt. Updated May 18 2010; accessed May 25, 2012.

San Francisco Department of Public Health (SFDPH). 2012. Maher Ordinance Map. http://www.sfdph.org/dph/eh/HazWaste/MaherSiteMap.asp. Accessed May 16, 2012.

San Francisco Planning Department (SFPD). 2012. San Francisco Zoning Map. May.

San Francisco Public Works Code. 1986. Chapter 10, Article 20, §1000 *et seq.* Ordinance #253-86, "Maher Ordinance."

3.9 Hydrology and Water Quality

3.9.1 Introduction

This section discusses the existing surface water and groundwater hydrology, quality, and use in the project area, as well as the potential for erosion and flooding. It also discusses the potential impacts from development and operation of the project on surface water and groundwater quality.

Potential impacts to hydrology and water quality were evaluated by considering the initial construction activities and the long-term operation of the project. Potential impacts were evaluated using the CEQA criteria as presented in Table 3.9-1. It is concluded that project impacts will be less than significant. Implementation of the APMs described in Section 3.9.4.2 will further reduce less than significant impacts to hydrology and water quality. PG&E will comply with all applicable federal, state, and local regulatory requirements that protect surface water and groundwater.

TABLE 3.9-1
CEQA Checklist for Hydrology and Water Quality
Embarcadero-Potrero 230 kV Transmission Project

IV. HYDROLOGY AND WATER QUALITY **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporation**	**Less than Significant Impact**	**No Impact**
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☑	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☑
c) Substantially alter the existing drainage pattern of the site area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☑
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate of amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☑
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☑	☐
f) Otherwise substantially degrade water quality?	☐	☐	☑	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☑
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☑
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☑	☐

3.9.2 Regulatory Background and Methodology

3.9.2.1 Regulatory Background

The following sections provide a brief overview of regulations governing hydrology and water quality which may be applicable to the project.

Federal or Federal Delegated

Clean Water Act

Under the federal Clean Water Act (CWA) of 1972, the U.S. Environmental Protection Agency (USEPA) established the National Pollutant Discharge Elimination System (NPDES) program to protect water quality of receiving waters. Municipal and industrial wastewater and stormwater discharges are required to be in compliance with an NPDES permit. The NPDES permit lists discharge prohibitions, effluent limitations, pretreatment standards, and other provisions or monitoring programs deemed necessary to protect water quality. At the state level, these permits are issued by the Regional Water Quality Control Boards, but the USEPA may retain jurisdiction at its discretion. The following federal regulations pertain to the CWA. Section 404 of the CWA and Section 10 of the Rivers and Harbors Act are also addressed in Section 3.5 Biological Resources.

Section 303(d). In accordance with Section 303(d) of the Clean Water Act, states develop a list of "impaired water bodies" for submittal to the USEPA; impaired water bodies are defined as those water bodies that do not meet water quality standards. The CWA requires the development of total maximum daily loads (TMDLs), to improve water quality of impaired water bodies. Implementation of this program in the project area is conducted by the San Francisco Bay RWQCB. The RWQCB has listed the Central Bay portion of the San Francisco Bay as well as Crissy Field Beach, Islais Creek and Mission Creek as impaired water bodies (RWQCB, 2009). Central Bay in the RWQCB Basin Plan, is defined as the area to the north of the Bay Bridge. The area south of the Bay Bridge, where the project is located, is referred to as the Lower Bay and is not on the list.

Section 401. Although the project does not involve traditional dredging, and no changes to the bottom elevation of the bay are planned as part of the project, the use of a hydroplow to bury the submarine cables and/or the small pits at the HDD ends in the bay may be considered dredging bottom sediments. Dredging permit applicants intending to dispose of material in water must obtain a water quality certification from the State of California through the applicable regional water board, in this case the San Francisco Bay Regional Water Quality Control Board (RWQCB). The RWQCB, after reviewing the project, may recommend to the State Water Resources Control Board (SWRCB) that certification be granted or denied. Dredged material considered for disposal in water must be tested to determine its suitability for disposal. Authority to determine suitability is exercised by the state under Section 401 of the CWA.

Section 402. Stormwater discharges associated with project construction, equipment staging areas, and laydown yards are regulated under the NPDES permitting system. Construction activities that disturb one acre or more are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit) (Order No. 2009-0009-DWQ; NPDES Permit No. CAS000002). The General Construction Permit requires submission of a Notice of Intent (NOI) and preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must include specifications for Best Management Practices (BMPs), conducting monitoring and inspections, retaining monitoring records, reporting incidences of noncompliance, and submittal of annual compliance reports. The General Construction Permit also regulates non-stormwater discharges, such as those associated with dewatering of trenches or other excavations used during construction.

Section 404. Filling of waters of the United States (including wetlands) are subject to U.S. Army Corps of Engineers (USACE) jurisdiction under Section 404 of the CWA. The USACE is mandated to protect and maintain navigable capacity of the nation's waters under Section 33 of the Code of Federal Regulations (CFR), Navigation and Navigable Waters. Section 33 CFR requires the USACE to issue permits for dredging and placement of dredged or fill material into the waters of the U.S., and for ocean dumping of dredged material.

Dredging material for disposal at aquatic sites must undergo testing to determine its potential effects on the disposal site environment. Testing is also used to determine whether dredged material is suitable for unconfined aquatic disposal. For project disposal sites in or potentially affecting inland waters, such as San Francisco Bay, testing requirements are defined by Section 404 of the CWA, and a Section 404 permit would be required. A Water Quality Certification from the RWQCB pursuant to Section 401 of the CWA is required for Section 404 permit actions.

Dredged Materials Management Office Dredging

The DMMO was created as part of the LTMS Program for processing applications for dredging and disposal projects in the San Francisco Bay region. The DMMO is an interagency group that includes USEPA, USACE, SLC, BCDC, and CDFG, and cooperatively reviews sediment quality sampling plans, analyzes the results of sediment quality sampling, makes suitability determinations for disposal, and offers a consolidated application that can be jointly processed before each agency issues their respective permits for dredging and disposal projects in San Francisco Bay.

Rivers and Harbors Act of 1899

The Rivers and Harbors Act of 1899 regulates development and use of the nation's navigable waterways. Section 10 of the Act prohibits unauthorized obstruction or alteration of navigable waters, and vests regulatory authority in the USACE for work in, under, or over any navigable water of the U.S. The law applies to any dredging or disposal of dredged materials, excavation, filling, rechannelization, or any other modification of navigable water.

Oil Pollution Act of 1990 (OPA)

This is the principal statute governing oil spills into the nation's waterways. OPA was passed in the wake of the Exxon Valdez oil spill in March of 1989. The statute establishes liability and limitations on liability for damages resulting from oil pollution, and establishes a fund for the payment of compensation for such damages. In conjunction with CERCLA, OPA mandates a National Oil and Hazardous Substances Pollution Contingency Plan (NCP) to provide the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants, and contaminants. OPA requires preparation of spill prevention and response plans by coastal facilities, vessels, and certain geographic regions. OPA amended the CWA and includes the Oil Terminal and Oil Tanker Environmental Oversight and Monitoring Act of 1990. OPA further requires increased United States Coast Guard (USCG) involvement with vessel traffic service systems, vessel and facility monitoring, and oil spill prevention and cleanup.

The Ports and Waterways Safety Act of 1972

As amended by the Port and Tanker Safety Act of 1978, this act provides the strongest authority for the USCG's program to increase vessel safety and protect the marine environment in ports, harbors, waterfront areas, and navigable waters. It authorizes Vessel Traffic Services, controls vessel movement, and establishes requirements for vessel operation and other related port safety controls (see also Section 3.16, Traffic).

In addition, a number of other laws call for USCG enforcement. These include the Federal Water Pollution Control Act, which delegates enforcement authority and responsibility to the USCG in cases where oil and hazardous substances are discharged into U.S. waters in harmful quantities. The Act to Prevent Pollution from Ships limits the operational discharges of oil from ships and requires reception facilities to receive waste that cannot be discharged at sea. The Marine Protection, Research and Sanctuaries Act of 1972 requires USCG surveillance of ocean dumping activities.

State or State Delegated

Porter-Cologne Water Quality Control Act

This provision of the California Water Code regulates water quality in California and authorizes SWRCB and nine regional water boards with implementation and enforcement of the regulations. The SWRCB, as authorized by the act, has promulgated regulations designed to protect water quality from the effects of waste discharges to

land. Wastes that cannot be discharged directly or indirectly to waters of the state (and therefore must be discharged to land for treatment, storage, or disposal) are classified to determine specifically where such wastes may be discharged.

RWQCB. The project area is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board. The RWQCB is responsible for protecting the beneficial uses of water resources in the Bay. The RWQCB implements water-quality regulations under the State Porter-Cologne Act and the Federal CWA, in addition to administering the NPDES stormwater-permitting program in the San Francisco Bay region. The RWQCB may also act by either issuing or waiving waste discharge requirements for dredging projects with upland disposal of dredged material. These actions by the RWQCB are not equivalent to issuing water quality certification under Section 401 of the CWA.

The RWQCB adopted the first comprehensive Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) in April 1975 with subsequent major revisions adopted in 1982, 1986, 1992, 1995, 2002, and 2004. The Basin Plan (RWQCB, 2011) sets forth implementation policies, goals, and water management practices in accordance with the Porter-Cologne Water Quality Control Act. It also establishes both numerical and narrative standards and objectives for water quality specific to the Bay Area aimed at protecting aquatic resources. Discharges to the surface waters in the region are subject to the regulatory standards set forth in the Basin Plan.

McAteer-Petris Act San Francisco Bay Conservation and Development Commission (BCDC) and San Francisco Bay Plan

The McAteer-Petris Act directs the BCDC to exercise its authority to issue or deny permit applications for placing fill, extracting materials, or changing the use of any land, water, or structure within the area of its jurisdiction, in conformity with the provisions and policies of both the McAteer-Petris Act and the San Francisco Bay Plan. Thus BCDC is directed by the Act to carry out its regulatory process in accord with the Bay Plan policies and Bay Plan maps which guide the protection and development of the Bay and its tributary waterways, marshes, managed wetlands, salt ponds, and shoreline (BCDC, 2008).

The BCDC regulates dredging and disposal under the provisions of the McAteer-Petris Act. BCDC also administers the federal Coastal Zone Management Act within San Francisco Bay. The BCDC's jurisdiction includes the Bay and a 100-foot shoreline band, salt ponds, managed wetlands, tidal marshes 5 feet above mean sea level, and certain named tributary waterways, such as rivers (BCDC, 2008). The only project facilities to be located in BCDC jurisdictional areas would be the buried submarine cable. The two landing sites are located outside of the 100-foot shoreline band.

The San Francisco Bay Plan was first adopted by BCDC in 1968, and has been amended periodically since with the latest amendment in 2008. According to the San Francisco Bay Plan, BCDC can authorize dredging when it can be demonstrated that the dredging is needed to serve a water-oriented use or other important public purpose, the materials to be dredged meet the water quality requirements of the RWQCB, important fisheries and natural resources would be protected, dredging is minimized through project siting and design, and the materials would, if feasible, be reused or disposed outside the Bay and certain waterways.

The project is located within the portion of the Bay designated in the Plan as Lower San Francisco Bay. Lower San Francisco Bay stretches from the Bay Bridge south to the Dumbarton Bridge (see Figure 3.9-1).

Dredging and disposal activity in San Francisco Bay, marshes and some creeks requires a permit from BCDC. BCDC works with its federal, state and local partners in the Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) to manage dredging and disposal activities in the Bay Area. The LTMS Program is a collaborative partnership involving the regulatory agencies, resource agencies and stakeholders working together to maximize beneficial reuse of dredged material and minimize disposal in the Bay and at the Deep Ocean Disposal Site. The sponsoring agencies of the Dredged Materials Management Office (DMMO) and LTMS include the USEPA, USACE, SWRCB, RWQCB, and BCDC.

The Port of San Francisco

In 1968, the State transferred its responsibilities for the San Francisco waterfront to the City and County of San Francisco through the Burton Act. As a condition of the transfer, the State required the City to create a Port Commission that has the authority to manage the San Francisco waterfront for the citizens of California. The Port of San Francisco is a public agency responsible for managing the 7.5 miles of San Francisco Bay shoreline stretching from Hyde Street Pier in the north to India Basin in the south. The Port's responsibilities include promoting maritime commerce, navigation, and fisheries; restoring the environment; and providing public recreation. Although the Port is a department of the City and County of San Francisco, the Port receives no financial support from the City, and relies almost solely on the leasing of Port property for its revenues (Port of San Francisco, 1997). A Port lease and compliance with the conditions of the lease will likely be required for Port property.

The Port of San Francisco has authority over Potrero Switchyard area and the submarine cable and portions of the HDD. Both the proposed northern landing site and the proposed southern landing site are under the jurisdiction of the Port of San Francisco.

Regional and Local

Because the CPUC has exclusive jurisdiction over project siting, design, and construction, the project is not subject to local discretionary regulations. The following summary of local regulations and regulatory agencies relating to hydrology and water quality is provided for informational purposes and to assist with the CEQA review.

City and County of San Francisco

The City and County, along with the Port and BCDC, adopted the San Francisco Waterfront Special Area Plan (Special Area Plan). The Bay Plan policies that are most relevant to the proposed project with respect to water quality and hydrology are as follows:

Water Quality

Policy 1: Bay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality. Fresh water inflow into the Bay should be maintained at a level adequate to protect Bay resources and beneficial uses.

Policy 2: Water quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board's Basin Plan.

Policy 3: Shoreline projects should be designed and constructed in a manner that reduces soil erosion and protects the Bay from increased sedimentation through the use of appropriate erosion control practices.

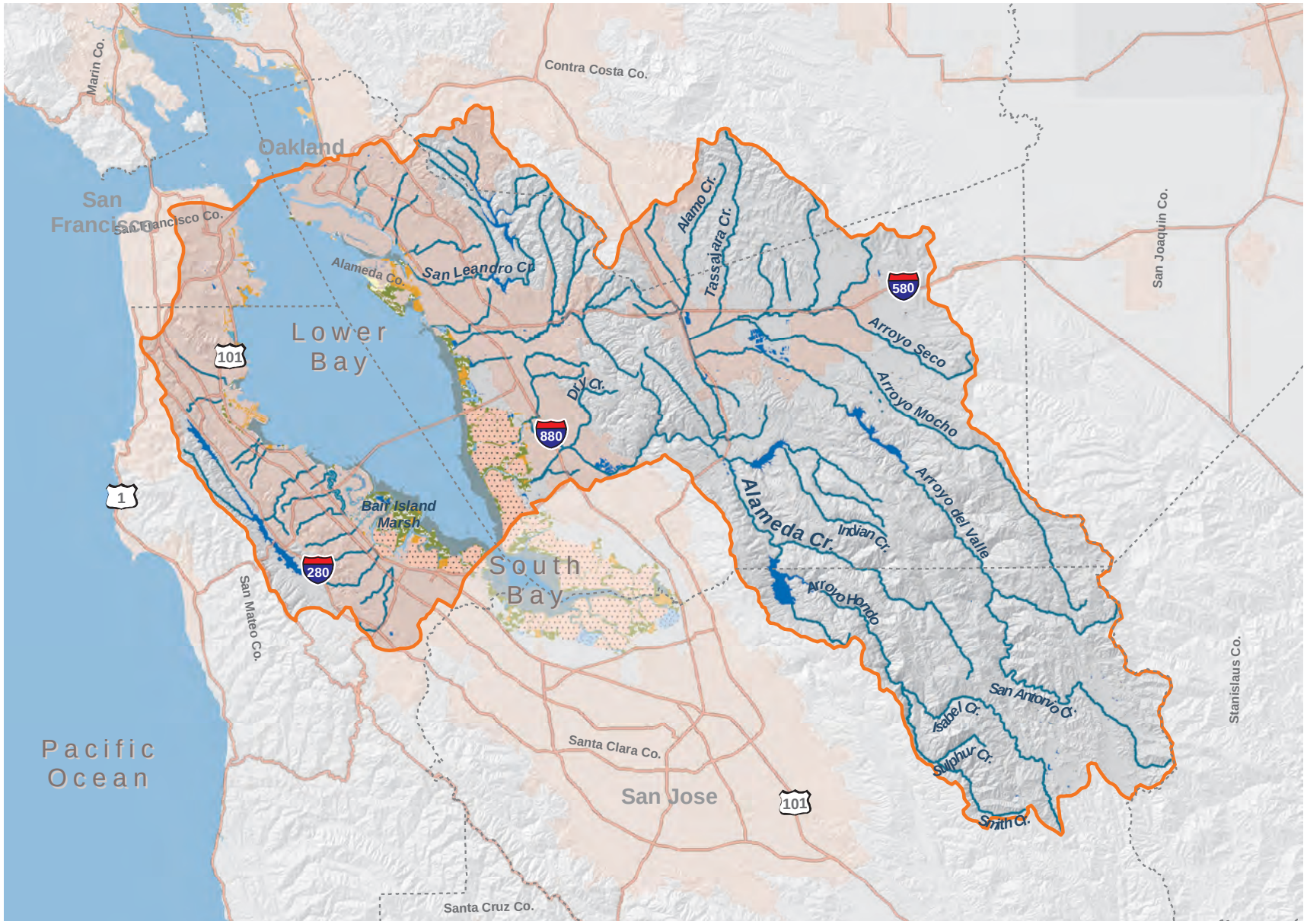
Policy 4: Polluted runoff from projects should be controlled by the use of best management practices in order to protect the water quality and beneficial uses of the Bay, especially where water dispersion is poor and near shellfish beds and other significant biotic resources. Whenever possible, runoff discharge points should be located where the discharge will have the least impacts. Approval of projects involving shoreline areas polluted with hazardous substances should be conditioned so that they will not cause harm to the public or the beneficial uses of the Bay.

3.9.2.2 Methodology

Information on surface water and groundwater in the project area was obtained from available maps and published reports completed by and for state, county and local water agencies. Additional information from city, county, regional, and state water agencies was obtained as necessary. Site-specific surveys were not conducted

by specialists to determine the water quality for the project area because existing available information was sufficient to address potential project impacts.

Areas of existing soil and water quality degradation were identified by searching federal and state regulatory-agency databases that track sites with known, suspected, or potential hazardous-substance



Source: Regional Water Quality Control Board Basin Plan, 2009.

North

0 6 12

Approximate scale in miles

FIGURE 3.9-1
South Bay Basin
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

contamination (e.g., underground storage tanks or landfills). The results of the database search are provided in Section 3.8, Hazards and Hazardous Materials.

3.9.3 Existing Setting

3.9.3.1 Regional Hydrology

The project is located within the San Francisco Bay Hydrologic Basin of California. The onshore portions of the proposed project are located in heavily urbanized areas in the City of San Francisco with no natural drainages. Development has resulted in the construction of underground drains to replace creeks; filling of tidal marshes, lakes, and the bay; and construction of artificial lakes and reservoirs. San Francisco is subdivided into several historical watersheds, each of which drains to a common part of the Bay during wet weather. Embarcadero Substation is located in the Mission Creek Watershed which drains toward the historic tidal marshes of Mission Creek into China Basin, and Potrero Switchyard is located in the Islais Creek Watershed which drains toward Islais Creek.

Most of the time, San Francisco's present-day drainage system in the project area collects municipal sewage and storm runoff from the east side of the peninsula together in a combined storm drain system and routes it through large transport/storage structures extending along the shoreline to the Southeast Treatment Plant, located on the south side of Islais Creek Channel near Third and Evans Streets (see also Section 3-17, Utilities). A portion of the area may drain though separate Port facilities near the shoreline.

The onshore topography of the project area varies from approximately 50 feet above mean sea level (amsl) at Embarcadero Substation to approximately 20 feet amsl at Potrero Switchyard (USGS, 1995). The project route extends east and beneath the San Francisco Bay from these two locations (see Figure 2-2, Project Location).

3.9.3.2 San Francisco Bay

The San Francisco Bay estuarine system is the largest estuary on the west coast of the United States. It functions as the only drainage outlet for waters of the Central Valley and conveys the waters of the South Bay tributaries and of the Sacramento and San Joaquin rivers into the Pacific Ocean. The Bay supports estuarine habitat, industrial service supply, and navigation in addition to all of the uses supported by the streams that flow into the Bay. The project is located in the northernmost portion of the South Bay division of San Francisco Bay which extends from the San Francisco-Oakland Bay Bridge southward (RWQCB, 2011), in an area referred to as Lower San Francisco Bay (see Figure 3.9-1).

San Francisco Bay is relatively shallow and subject to high rates of sediment input, transport, and redeposition. About 40 percent of the Bay is less than 6 feet deep and about 70 percent is less than 16 feet deep (City of San Francisco, 1996).

From Potrero Switchyard, the route for the 230 kV transmission cable is proposed to run along 23rd Street east to the San Francisco Bay shoreline. Offshore of Potrero Switchyard, San Francisco Bay is approximately 10 feet deep along the east-west portion of the proposed route. The Bay waters trend from approximately 30 feet deep to about 70 feet deep along the south to north portion of the proposed transmission line route. At the northern terminus offshore from Embarcadero Substation, the Bay is between 25 and 35 feet deep at the proposed northern landing through Berth 30 between Piers 28 and 30/32.

3.9.3.3 Surface Water Features

Rivers and streams in the urbanized project area have been channelized. The main drainage in the area is Mission Creek Channel which is located between Potrero Switchyard and Embarcadero Substation and drains eastward into China Basin. It is a navigable tidal channel that is currently undergoing a restoration project to reestablish areas of wetland habitat and stabilize channel banks. In historic times Mission Creek emptied into Mission Bay, which existed as an estuary of combined salt and freshwater marshes, tidal mudflats, and shallow bay. Artesian springs on Potrero Hill and tributaries originating on Twin Peaks fed Mission Creek prior to urbanization (Ramirez-Herrera, 2006). Approximately 2,500 feet south of Potrero Switchyard, another main regional drainage, Islais Creek Channel, drains into the San Francisco Bay.

3.9.3.4 Precipitation and Infiltration

The project area has a semi-arid Mediterranean climate characterized by dry, mild summers and moderately moist, cool winters. Most precipitation falls as rain in the winter and spring, with an average annual precipitation of 17.5 inches (CAL FIRE, 2000). Surface water flows in the region are highly seasonal, with more than 90 percent of the annual runoff occurring during the winter rainy season between October and April. Many streams go dry during the middle or late summer (RWQCB, 2011).

Regional development has increased the amount of impervious surfaces and the rates of runoff. Local creeks in the urbanized project area (e.g., Mission Creek and Islais Creek) are highly channelized, and runoff into these channels is managed above and below ground as part of the stormwater and sewer water conveyance systems.

3.9.3.5 Surface Water Quality

The Basin Plan (RWQCB, 2011) is the RWQCB's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan has been adopted and approved by the SWRCB, USEPA, and the Office of Administrative Law, where required (RWQCB, 2011).

Since 1993, the San Francisco Estuary Institute (SFEI) has administered a Regional Monitoring Program (RMP) for the RWQCB and major Bay dischargers. Most dischargers to the Bay are required to participate in the RMP as a condition of their discharge permit. SFEI conducts monitoring from the Delta to the South Bay. The Estuary is divided into five regions for the RMP, and eight random locations are sampled within each region each year for sediment quality (SFEI, 2011). Four or more random locations within each region are sampled for water quality. In addition, a few historical fixed sites are sampled annually for long-term trend analysis. It should be noted that the RMP divides the Bay differently from the Basin Plan, so while the project is in the lower Bay in the Basin Plan, the same area is considered Central Bay in the RMP.

The RMP seeks to characterize contaminant concentrations in San Francisco Estuary water, sediment, fish, and shellfish. The ultimate goal is to determine how contaminant concentrations in the Estuary are changing in response to pollution prevention and reduction measures, and to provide feedback to water quality management agencies. The five key objectives are:

- To describe patterns and trends in contaminant concentration and distribution
- To describe general sources and loadings of contamination to the Estuary
- To measure contaminant effect on selected parts of the Estuary ecosystem
- To compare monitoring information to relevant water quality objectives and other guidelines
- To synthesize and distribute information from a range of sources to present a more complete picture of the sources, distribution, fates, and effects of contaminants in the Estuary ecosystem

Data collected for the RMP indicate contamination areas in the Estuary. The primary known contamination problems include:

- The top water quality concerns in the Estuary are polychlorinated biphenyls (PCBs) and mercury
- Measured values of contaminants in the Estuary exceed relevant water, sediment, and tissue quality guidelines
- The South Bay most frequently exceeds the guidelines
- The northern and southern segments exceed the guidelines more frequently than the Central Bay
- Estuary waters do not tend to be toxic and there has been a decrease in the incidences of aquatic toxicity observed in the tributaries during storm events between 1997 and 2001

Water quality data from the RMP Annual Monitoring Results for the Central Bay Region was downloaded from the Contaminant Data Display and Download (CD3) database (SFEI, 2012) and is summarized in Table 3.9-2.

TABLE 3.9-2
San Francisco Bay Central Region Water Quality Data (2008-2009)
Embarcadero-Potrero 230 kV Transmission Project

Constituent	Concentration (µg/L)				
	Maximum Measured	Median Measured	Water Quality Objectives [a]		
			4-day Avg	1-hr Avg	24-hr Avg
Arsenic	2.5	2.05	36	69	N.A.
Cadmium	0.113	0.1	9.3	42	N.A.
Copper	3.17	1.66	3.1 2	4.8 [b]	N.A.
Lead	0.60	0.34	8.1	210	N.A.
Mercury	0.009	0.005	0.025	2.1	N.A.
Nickel	4.12	2.34	8.2	74	N.A.
Selenium	0.176	0.156	5 [c]	20 3	N.A.
Silver	0.014	0.006	N.A.	1.9	N.A.
Zinc	4.19	2.24	81	90	N.A.
Polycyclic Aromatic Hydrocarbons (PAH) [d]	0.042	0.028	N.A.	N.A.	15
Polychlorinated Biphenyls (Sum of 268 PCBs)	0.000295	0.000222	N.A.	N.A.	N.A.

Notes:
Table source is RMP Annual Monitoring Results for the Central Bay Region downloaded from the Contaminant Data Display and Download (CD3) database (SFEI, 2012).
µg/L = micrograms per liter.
N.A. = No guideline available.
[a] Source: San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan) (RWQCB, 2011).
[b] Water quality objectives for copper were promulgated by the California Toxics Rule (CTR) and may be updated by USEPA without amending the Basin Plan. Note: at the time of writing of the Basin Plan, the values were 3.1 µg/L (4-day average) and 4.8 µg/L (1-hr. average).
[c] Selenium criteria were promulgated for all San Francisco Bay/Delta waters in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing of the Basin Plan, the values were 5.0 µg/L (4-day average) and 20 µg/L (1-hr. average).
[d] All data are from 2009 except PAH data, which are from 2008.

3.9.3.6 Groundwater Hydrology, Use and Quality

Shallow groundwater is present throughout much of the City of San Francisco, and is expected in the project area due to the low elevations and proximity to the San Francisco Bay (Gregg, 2009). Groundwater is estimated to occur between 5 and 20 feet below ground surface throughout the project area. Near the Bay, groundwater levels may be tidally influenced, but the groundwater gradient flow is generally eastward toward the Bay (Essex, 2003).

Groundwater development potential for the groundwater basins on the Bay side of the peninsula appears low, and no current municipal or domestic use exists or is planned (RWQCB, 1996). Potential future use of groundwater is limited to non-potable uses due to the historic industrial development, high salinity, and density of contaminated sites (Essex, 2003).

The project area has been affected by historical industrial uses, and potential contamination in soil and groundwater has been documented at several locations along the project route (see Section 3.8, Hazards and Hazardous Materials).

3.9.3.7 Sediment Quality

Recent sediment quality data collected for the RMP (SFEI, 2012) within the central section of San Francisco Bay, and summarized in Table 3.9-3, indicate that the project area may have relatively high levels of mercury, nickel, and polycyclic aromatic hydrocarbons (PAHs) and marginally high levels of arsenic, copper, and PCBs when compared to the National Oceanic and Atmospheric Administration (NOAA) sediment benchmarks termed Effects Range Low (ERL) and Effects Range Mean (ERM) (Buchman, 2008). Sediment concentrations greater than the ERM are generally interpreted as an indication of contamination.

TABLE 3.9-3
San Francisco Bay Central Region Sediment Quality Data (2005-2010)
Embarcadero-Potrero 230 kV Transmission Project

Constituent	Concentrations			
	Maximum Measured	Median Measured	Screening Concentrations	
			ERL[a]	ERM[b]
Metals				
Arsenic (mg/kg dw)	18.30	9.94	8.2	70
Cadmium (mg/kg dw)	0.34	0.21	1.2	9.6
Copper (mg/kg dw)	43.89	36.35	34	270
Lead (mg/kg dw)	33.20	20.09	46.7	218
Mercury (mg/kg dw)	0.94	0.25	0.15	0.71
Nickel (mg/kg dw)	86.9	73.8	20.9	51.6
Selenium (mg/kg dw)	0.46	0.19	N.A.	N.A.
Silver (mg/kg dw)	0.378	0.194	1.00	3.70
Zinc (mg/kg dw)	129	97	150	410
Polycyclic Aromatic Hydrocarbons (Sum of 25 PAHs) (µg/kg dw)	43,047 (CB044S)	3,086	4,022	44,792
Polybrominated Diphenyl Ethers (PBDE) (µg/kg dw)	9.3	2.08	N.A.	N.A.
Polychlorinated Biphenyls (Sum of 40 PCBs) (µg/kg dw)	21.8	9.5	22.7	180.0
Total DDTs (µg/kg dw)	13.3	2.8	1.58	46.1
Total Chlordanes (µg/kg dw)	0.35	0.14	0.5	6.0
Dieldrin (µg/kg dw)	0.19	0.08	0.02	8.00
Dioxins/Furans (µg/kg dw) [c]	0.38	0.29	N.A.	N.A.

Notes:
Table source is RMP Annual Monitoring Results for the Central Bay Region downloaded from the Contaminant Data Display and Download (CD3) database (SFEI, 2012).
mg/kg dw= milligrams per kilogram or dry weight material; µg/kg dw= micrograms per kilogram of dry weight material.
N.A. = No guideline available.

[a] ERL: Effects Range-Low are levels that are indicative of concentrations below which adverse effects rarely occur (Long et al., 1995).
[b] ERM: Effects Range-Median are levels above which adverse effects frequently occur (Long et al., 1995).
[c] All data are from 2005-2010 except dioxin/furans data, which are from 2008-2010.

3.9.3.8 Flood and Inundation Potential

Neither the Federal Emergency Management Agency's (FEMA's) floodplain identification program nor the National Flood Insurance Program (NFIP), which designates flood-prone areas, have currently identified flood-

prone areas in San Francisco. FEMA is preparing Flood Insurance Rate Maps (FIRMs) at the City and Port's request, which may be available in 2012 in draft form. The City of San Francisco is not subject to flooding of natural waterways, but portions of shoreline areas are subject to flooding from the Bay. The City has prepared Interim Floodplain Maps (City of SF, 2008). None of the project structures are within the identified flood hazard zones (Figure 3.9-2); the cables pass under the flood zones in the HDD segments.

Flooding as a result of dam or reservoir failure is unlikely, and is most likely to occur as a result of an earthquake (City of San Francisco, 1996). Dams and reservoirs that hold large volumes of water represent a potential flood hazard due to failure caused by ground shaking. The San Francisco Water Department owns above-ground reservoirs and tanks within San Francisco and has delineated inundation areas. The project area is not located within one of these areas (Ritter, 1972).

Tsunamis are large waves in the ocean or other large water bodies generated by earthquakes, coastal or submarine landslides, or volcanoes. Most California tsunamis are associated with distant earthquakes, typically in Alaska or South America, not with local earthquakes, and damaging tsunamis are not common on the California coast. Due to the lack of reliable information regarding tsunami run-ups that have occurred in the prehistoric past, there is considerable uncertainty over the potential extent of tsunami run-up that could occur in the Bay Area; research is ongoing. Because of the low elevation and proximity to the San Francisco Bay, portions of the project are located in an area where flooding is possible in the unlikely event of a major tsunami (Uslu, 2010). The areas near both planned landing sites and the entire Potrero Switchyard are within a tsunami inundation area, as delineated by the California Emergency Management Agency (CEMA, 2012) and the California Geological Survey (CGS, 2012). However, devastating tsunamis have not occurred in historic times in the San Francisco Bay area, and the likelihood of such an event occurring is considered remote.

3.9.4 Applicant-Proposed Measures and Potential Impacts

3.9.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, impacts to hydrology and water quality may be considered significant if the project were to violate water quality standards or waste discharge requirements, adversely affect groundwater supplies or existing drainage patterns, increase exposure of people or structures to inundation, create unfavorable runoff conditions, or degrade water quality.

3.9.4.2 Construction Applicant-Proposed Measures

The following APMs include measures that are required by existing regulations as well as requirements or standard practices that will minimize or prevent potential impacts during project construction.

APM WQ-1. Development and Implementation of a Stormwater Pollution Prevention Plan (SWPPP). Stormwater discharges associated with project construction activities are regulated under the General Construction Permit. Cases in which construction will disturb more than one acre of soil require submittal of a Notice of Intent, development of a SWPPP (both certified by the Legally Responsible Person (LRP), periodic monitoring and inspections, retention of monitoring records, reporting of incidences of noncompliance, and submittal of annual compliance reports. PG&E will comply with all General Construction Permit requirements.

Following project approval, PG&E will prepare and implement a SWPPP, which will address erosion and sediment control to minimize construction impacts on surface water quality. The SWPPP will be designed specifically for the hydrologic setting of the proposed project in proximity to the San Francisco Bay. Implementation of the SWPPP will help stabilize graded areas and reduce erosion and sedimentation. The SWPPP will designate BMPs that will be adhered to during construction activities. Erosion and sediment control BMPs, such as straw wattles, erosion control blankets, and/or silt fences, will be installed in compliance with the SWPPP and the General Construction Permit. Suitable soil stabilization BMPs will be used to protect exposed areas during construction activities, as specified in the SWPPP. During construction activities, BMPs will be in place to address construction materials and wastes.

Source: City of San Francisco 2008.

LEGEND

Special Flood Hazard Area

Lots In Hazard Area

FIGURE 3.9-2

East San Francisco Flood Plain Map

Embarcadero-Potrero 230 kV Transmission Project

San Francisco, CA

BMPs, where applicable, will be designed by using specific criteria from recognized BMP design guidance manuals. Erosion and sediment-minimizing efforts will include measures such as the following:

- Defining ingress and egress within the project site to control track-out
- Implementing a dust control program during construction
- Properly containing stockpiled soil

Identified erosion and sediment control measures will be installed in an area before construction begins and inspected and improved as needed before any anticipated storm events. Temporary sediment control measures intended to minimize sediment transport from temporarily disturbed areas, such as silt fences or wattles, will remain in place until disturbed areas are stabilized. In areas where soil is to be temporarily stockpiled, soil will be placed in a controlled area and managed with similar erosion-control techniques. Where construction activities occur near a surface water body or drainage channel, the staging of construction materials and equipment and excavation spoil stockpiles will be placed at least 50 feet from the water body and properly contained, such as with berms and/or covers, to minimize risk of sediment transport to the drainage. Any surplus soil will be transported from the site and appropriately disposed of.

A copy of the SWPPP will be provided to the CPUC for recordkeeping. The plan will be maintained and updated during construction as required by the SWRCB.

APM WQ-2. Implementation of a Worker Environmental Awareness Program. The project's worker environmental awareness program will communicate environmental issues and appropriate work practices specific to this project to all field personnel. These will include spill prevention and response measures and proper BMP implementation. The training program will emphasize site-specific physical conditions to improve hazard prevention (such as identification of flow paths to nearest water bodies) and will include a review of all site-specific water quality requirements, applicable portions of erosion control and sediment transport BMPs contained in the SWPPP (APM WQ-1) and the health and safety plan (see APM HM-2 in Section 3.8.4.2). A copy of the project's worker environmental awareness training record will be provided to the CPUC for recordkeeping. An environmental monitoring program will also be implemented to ensure that the plans are followed throughout the construction period.

APM WQ-3 (also see APM HM-1). Implementation of Hazardous Material and Emergency Response Procedures. PG&E will implement construction controls, training and communication to minimize the potential exposure of the public and site workers to potential hazardous materials during all phases of project construction.

These construction practices include construction worker training appropriate to the site worker's role (see APM HM-3), containment and spill control practices in accordance with the SWPPP (see APM WQ-1), and emergency response to ensure appropriate cleanup of accidental spills. If it is necessary to store chemicals, they will be managed in accordance with all applicable regulations. Material safety data sheets will be maintained and kept available on site, as applicable. The project SWPPP (APM WQ-1) will identify areas where refueling and vehicle-maintenance activities and storage of hazardous materials, if any, will be permitted.

APM WQ-4 (also see APM HM-4). Emergency Spill Supplies and Equipment. Materials will be available on the project site during construction to contain, collect and dispose of any minor spill (for example, absorbent material, tarps, and storage drums). In the event that excess water or liquid concrete escapes during pouring activities, it will be directed to lined and bermed areas adjacent to the borings, where the water will evaporate and the concrete will begin to set. Once the excess concrete has been allowed to set up, it will be removed and transported for disposal, according to applicable regulations.

APM WQ-5 (also see APM HM-5). Soil Sampling/Wastewater and Groundwater Characterization. Soil sampling and potholing will be conducted in onshore project areas before construction begins, and soil information will be provided to construction crews to inform them about soil conditions and potential hazards. If hazardous substances are unexpectedly encountered during trenching, work will be stopped until the material is properly characterized and appropriate measures are taken to protect human health and the environment. If excavation of hazardous materials is required, they will be handled in accordance with applicable regulations.

Prior to initiating excavation activities along the underground transmission cable routes, soil borings will be advanced to identify areas where contaminated groundwater may be contacted. The location, distribution, and/or frequency of the borings will give adequate representation of the conditions in the construction area. If suspected contaminated groundwater is encountered at the depths of the proposed construction, samples will be collected and submitted for laboratory analysis of petroleum hydrocarbons, metals, volatile organic compounds, and semi-volatile organic compounds. If necessary, groundwater will be collected during construction, contained, and disposed of in accordance with all applicable regulations. Appropriate personal protective equipment will be used and waste management will be performed in accordance with applicable regulations. Non-contaminated groundwater will be released to one of the city's combined sanitary and stormwater drainage systems (with prior approval) or contained, tested, and disposed of in accordance with applicable regulations.

APM WQ-6 (also see APM HM-6 and APM WQ-7). Horizontal Directional Drilling (HDD) Monitoring and Management.

HDD operations will include best management practices for monitoring for loss of drilling fluids, spill containment and response measures. Monitoring and response measures specific to the site subsurface conditions and construction equipment will be included in a Frac-out Plan. The objectives of this monitoring program are to quickly identify any unplanned release of drilling fluids during drilling; determine the size, extent, and location of the release; and evaluate and implement appropriate containment and cleanup measures after a release has occurred. Routine monitoring will be conducted at regular intervals during all drilling activities. More intensive monitoring will be implemented if drilling fluid circulation to the HDD endpoints is lost or an unplanned release is detected.

In general, both the drilling technique and early detection and response shall be used to minimize release of fluids to the environment. Techniques to minimize potential loss of drilling fluids include termination of the pilot hole short of the exit into the bay, monitoring of fluid pressures, and adjustments to the drilling fluid mix (see Section 2.6.4, Submarine Cable Installation. To minimize any potential impacts to water quality, drilling muds (which are heavier than water) shall consist of naturally occurring materials such as water and bentonite clay, plus inert, non-toxic polymers. Monitoring measures that will be included in the Frac-out Plan include use of dyes in the fluid, use of a fluorometer to determine dye concentrations in the water column, and monitoring by divers or side scan sonar in the event of loss of circulation of the fluid; potential responses to a release include measures such as reductions in drilling pressure, thickening of the fluid mixture, and in the event of an emergency, cessation or substantial reduction of drilling and fluid circulation. On land, measures would include installation of spill control berms and pits. For a release in the water column, divers and side scan sonar will be used to track the extent and location of the release. Appropriate containment and clean-up measures will be employed depending on the amount and location of the release, including disposal of material. Waste drilling fluids will be collected in a manner that is in accordance with all local, state and federal regulations.

APM WQ-7. Prevention of Contaminant Migration along HDD Route. The project will be designed to prevent contaminants along the HDD route from leaching to the shoreline or bay via the boreholes of the HDD. In areas of contamination (as determined by soil and sediment sampling) the HDD conduit can be sealed to effectively plug voids that might permit movement of contaminants down the HDD drill path after the HDD initial drill is established and the HDD conduit is being pulled into position. In the event that contaminants are found during pre-construction sampling, in areas where contaminants are found and where there are potential voids between the conduit and surrounding soil the voids will be filled with grout or similar material to prevent any potential preferential pathway for the passage of contaminants, as described below.

APM WQ-8 (see also APM HM-7). Sediment Testing Program and Sediment Controls for Submarine Cable and Offshore HDD Intercept. Sediments along the submarine cable route are located near known contaminated sediment areas (SFEI, 2012), and may be contaminated with PAHs, metals, and/or pesticides. These compounds are generally insoluble or have low solubility in water. Sediments will be temporarily disturbed during hydroplow operations and during excavation of the HDD exit pits. In coordination with the DMMO, PG&E will prepare a Sampling and Analysis Plan for the sampling and analysis of sediment along the submarine cable route and where the HDD exits into the Bay. As part of preparation and implementation of the Sampling and Analysis Plan, surveys

will be conducted to examine water depths, slopes, sediment types, potential contaminants, and any other activities or obstacles. Sensitive habitats, cultural resources, existing and abandoned pipelines, old cables, and material discarded on the bottom of the Bay will be located to ensure the new cable will be installed so as to avoid these conflicts or obstacles. In cases where a cable must cross a pipeline or existing cable, arrangements will be made with the owner of the existing installation to establish necessary separations between each installation (ICPC, 2009).

The HDD offshore exits were selected far enough into the Bay to minimize the potential for encountering near-shore contaminated sediments. At an HDD exit location, it is a common practice to deploy divers to excavate a collection pit approximately 100 to 400 square feet and 6 feet deep at the exit point depending on final design. The results of the sediment sampling will be used to plan the appropriate handling of sediment resulting from the excavation of the HDD pit as determined in consultation with the DMMO. As the HDD is installed, drilling muds, which are heavier than water, will collect in this excavated collection pit. A barge on the surface is used during HDD installation to pump these drilling muds into a containment tank on the barge/ship for appropriate disposal. Hydroplow installation causes temporary disturbance of sediments. Most of the fluidized material falls back behind the hydroflow jets and increases in turbidity along the narrow path of the jets are minimized. Turbidity is limited by controlling the pressure of the jets and the rate of hydroplow advancement. The hydroplow is instrumented to enable measurement and control of pressure and tow tension.

APM WQ-9. Project Site Restoration. As part of the final construction activities, PG&E will restore all removed curbs and gutters, repave, and restore landscaping or vegetation as necessary.

3.9.4.3 Operation and Maintenance Applicant-Proposed Measures

The following APMs include measures that are required by existing regulations and requirements or standard practices that will minimize or prevent any potential impacts during operation and maintenance of the project subsequent to completion of construction.

APM WQ-10. Spill Prevention, Control, and Countermeasure (SPCC) Plan for Potrero Switchyard. PG&E will prepare an SPCC plan for the new Potrero Switchyard or modify the existing SPCC plan at the existing switchyard to incorporate the new equipment as required by applicable regulations. The plans will include engineered and operational methods for preventing, containing, and controlling potential releases (e.g., construction of retention pond, moats, or berms) and provisions for quick and safe cleanup.

3.9.4.4 Potential Construction and Operation and Maintenance Impacts

The potential impacts associated with both the construction and O&M phases of the project are evaluated in this section. With implementation of the APMs discussed in Section 3.9.4.2, impacts associated with construction and O&M will be less than significant.

a) Would the project violate any water quality standards or waste discharge requirements? ***Less-than-significant impact.***

Construction Impacts

The following construction activities have the potential to degrade water quality, including the potential for violating water quality standards or waste discharge requirements:

Potential Groundwater Quality Degradation Caused by Construction of Underground Transmission Line. As discussed in Section 3.8, Hazards and Hazardous Materials, several known contaminated sites are located along or near the proposed project alignment. In addition, unknown sites of contaminated soil or groundwater could be present. Water quality could be affected if pre-existing contaminated groundwater is exposed and comes in contact with uncontaminated soil and/or groundwater during construction, or if contaminant mobility is enhanced as a result of the construction process (e.g., cross-contaminating soil during excavation, breaching of a confining layer, or through the transport of contaminated spoils).

HDD activities could also impact groundwater quality through loss of drilling fluids in subsurface soils that would increase suspended material in groundwater.

Implementation of the soil, groundwater, and wastewater characterization procedures described in APM WQ-5, as well as the worker awareness program described in APM WQ-2 and APMs WQ-6 and WQ-7 for HDD operations, will reduce the likelihood of cross-contamination and restrict contaminant mobility, reducing this potential impact to a less-than-significant level.

Potential Impacts to Surface Water. Potential impacts to surface water could result from onshore and offshore construction activities. Increased erosion and contaminated runoff as a result of onshore construction activities could potentially impact surface water quality in the project area. However, potential impacts would be temporary and limited by the scale of construction activities and would be reduced to less-than-significant levels with implementation of the SWPPP as outlined in APM WQ-1, the worker awareness program as described in APM WQ-2, and the site restoration activities in APM WQ-9.

The transition from submarine to terrestrial underground cable installations will be accomplished through borings using HDD. HDD activity could impact Bay water quality through loss of drilling fluids and disruption of Bay bottom sediments at the sediment surface where the borehole emerges. It is possible that a small amount of drilling fluid and disturbed sediment could be released into the Bay at the HDD borehole location. HDD could result in frac-out, which has the potential to affect water quality within the Bay by increasing suspended material; however, drilling muds are heavier than water and the bulk of the material would be expected to remain at the frac-out location. In addition, a small amount of material may be excavated to form a collection pit at the location where the HDD exits into the Bay. Excavated dredged material would be brought to the surface and deposited in a barge. Sediment testing, removal, handling, and disposal would be conducted as described in APM WQ-8, in accordance with a Dredging – Dredge Material Reuse/Disposal authorization acquired through the DMMO. Implementation of APM WQ-6, and the HDD techniques described in APM WQ-8 will reduce potential impacts to levels that are less than significant.

Hydroplow operations may produce temporary, localized increases in turbidity, estimated to disperse 15 feet in the softer sediments. Because of the localized nature of the increase in turbidity and the relatively small volume of suspended sediments anticipated, it would not be expected to significantly impact water quality. This disturbance could be similar to the level of turbidity rise from operation of tugboats or other vessels in shallower water, plumes from a clamshell buckets during minor dredging, or a winter storm. The sediments of San Francisco Bay are very dynamic, and thus the local disturbance of a small volume of sediment is a less than significant impact. Implementation of the sediment testing and control measures in APMs WQ-6 and WQ-8 will reduce potential impacts to levels that are less than significant.

Operation Impacts

Potential Water Quality Impacts from Spills During Operation and Maintenance. During operation and maintenance activities, water quality could potentially be impacted through inadvertent spills or discharges from new equipment at Potrero Switchyard which could wash into nearby drainages or infiltrate soil to the water table. With implementation of the SPCC plan described in APM WQ-10, an accidental release during operation and/or maintenance of the project is unlikely to occur and therefore, impacts would be less than significant.

b) Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? ***No impact.***

Where localized shallow groundwater is encountered, active and/or passive dewatering systems may be installed in trenches and excavations as appropriate to allow construction under dry conditions. Dewatering activities may have temporary and very localized effects on groundwater levels. However, there would be no impact on the groundwater table level beyond this very localized effect.

The underground portions of the proposed project will be installed under existing streets where soil has been disturbed and compacted during prior construction activities. The trench to be constructed for the underground line will be narrow and typically shallow (5 to 10 feet, except where additional depth is needed based on final

design). Soil in the trench vicinity will not experience any significant modification from that already underlying the streets, and is not expected to create a new barrier to groundwater flow.

c) Would the project substantially alter the existing drainage pattern of the site area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? ***No impact.***

The project will not substantially alter existing drainage patterns in the project area, so there will be no impact.

d) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate of amount of surface runoff in a manner which would result in flooding on- or off-site? ***No impact.***

The project will not substantially alter existing drainage patterns in the project area or substantially increase the rate of amount of surface runoff because it will not result in a substantial increase of impervious area; the project work areas are almost entirely paved.

e) Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? ***Less-than-significant impact.***

Scraping, grading, and/or excavation activities may be required for new equipment installation at Potrero Switchyard. In addition, construction will require equipment staging sites and laydown yards at locations not yet identified. Stormwater runoff in the project area is currently directed to the City of San Francisco's combined stormwater and sanitary sewer collection and treatment system which has sufficient capacity to accept stormwater from the project site. No new contributions of stormwater would be generated as a result of the project.

Onshore construction activities could increase the potential for soil erosion and uncontrolled runoff of stormwater contaminated with sediments or other pollutants if rainwater comes into contact with materials onsite and washes contaminants into storm drains, creeks, or directly into the bay. Potential sources of pollution include oil leaked from heavy equipment and vehicles, grease, hydraulic fluid, fuel, construction materials and products, waste materials, and erosion of disturbed soil.

Localized compaction of soil from construction activities, including the use of heavy equipment, could diminish the stormwater infiltration capacity at the Potrero Switchyard and Embarcadero Substation sites. However, this impact is considered less than significant because the effects will be minor and localized. Scraping and grading for temporary access roads and laydown yards may remove vegetation and disturb the soil surface, which will result in a temporary reduction in the infiltration and absorption capacity of the affected area. Potential impacts would be localized and temporary and are therefore considered less than significant.

Impacts would be temporary and limited by the scale of construction activities and would be reduced to less-than-significant levels with implementation of the SWPPP as outlined in APM WQ-1, the worker awareness program as described in APM WQ-2, and the site restoration activities in APM WQ-9.

f) Would the project otherwise substantially degrade water quality? ***Less-than-significant impact.***

Construction activities with the potential to degrade water quality are described under criterion a) above. As indicated, these potential impacts will be reduced to less than significant with implementation of APMs WQ-1, WQ-2, and WQ-5 through WQ-9.

g) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? ***No impact.***

There is no housing associated with this project; therefore there is no impact.

h) Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows? ***No impact.***

The project passes under the City's 100-year flood hazard zones in the HDD segments, and no other project facilities are located within the flood zones, so there will be no impact.

i) Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? ***No impact.***

The project will not create increased flooding potential or exposure of people or structures to flooding hazards; therefore there is no impact.

j) Would the project result in inundation by seiche, tsunami, or mudflow? ***Less-than-significant impact.***

The areas near both landing sites and the entire Potrero Switchyard are within a tsunami inundation area (CEMA, 2012). However, devastating tsunamis have not occurred in historic times in the San Francisco Bay area, and the likelihood of such an event occurring is considered remote. Therefore, this impact is considered less than significant.

3.9.5 References

Buchman, M.F., 2008. NOAA Screening Quick Reference Tables. NOAA OR&R Report 08-1. Office of Response and Restoration Division, National Oceanic and Atmospheric Administration, Seattle WA. 34 p.

California Department of Fish and Game Office of Spill Prevention and Response (CDFG OSPR). 2011. *San Francisco Oil Spill Contingency Plan*. October 1.

California Department of Forestry and Fire Protection (CAL FIRE). 2000. State of California Precipitation Map. Online: http://frap.cdf.ca.gov/webdata/maps/statewide/rainmap.pdf. Accessed on May 14, 2012. July 28.

California Emergency Management Agency (CEMA). 2012. "My Hazards" website. Online: http://myhazards.calema.ca.gov/. Accessed on May 17, 2012.

California Geological Survey (CGS). 2012. "CGS Tsunami Web Site." Online: http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/Pages/Index.aspx. Accessed on May 17, 2012

City of San Francisco Planning Department. 1996. *San Francisco General Plan.* June 27.

City of San Francisco. 2008. *Interim Floodplain Maps*. Online: http://sfgsa.org/index.aspx?page=828. Accessed on July 22, 2012.

Essex Environmental. 2003. *PG&E Potrero to Hunters Point 115 kV Cable Project Proponents Environmental Assessment.* December.

Gregg Drilling. 2009. Northern California Groundwater Depth Chart. Online: http://www.Greggdrilling.com. Accessed on May 17, 2012.

Institute of Electrical and Electronics Engineers Power & Energy Society (IEEE PES). 2005. *HVDC Systems & Trans Bay Cable*. March 16.

International Cable Protection Committee (ICPC). 2009. *Fishing and Submarine Cables, Working Together.* February 23.

Long, E. R., D. D. MacDonald, S. L. Smith, and F. D. Calder. 1995. "Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments." *Environmental Management* 19(1): 81-97.

Port of San Francisco. 1997. *Waterfront Land Use Plan.* June.

Ramirez-Herrera, M. T., Sowers, J. M. and C. M. Richard. 2006. *Creek & Watershed Map of San Francisco:* Oakland Museum of California. 1:25,800 scale.

Ritter, J., and W. Dupre. 1972. *Maps showing areas of potential inundation by tsunamis in the San Francisco Bay Region, California.* U.S. Geological Survey, Miscellaneous Field Studies, Map MF-480.

San Francisco Bay Conservation and Development Commission (BCDC). 2008. *San Francisco Bay Plan.* As amended from original publication in 1968. February 2008.

San Francisco Bay Regional Water Quality Control Board (RWQCB). 1996. *San Francisco and Northern San Mateo County Pilot Beneficial Use Designation Project.* April 4.

San Francisco Bay Regional Water Quality Control Board (RWQCB). 2009. *Evaluation of Water Quality Conditions for the San Francisco Bay Region. Proposed Revisions to Section 303(d) List. Staff Report.* February 2009.

San Francisco Bay Regional Water Quality Control Board (RWQCB). 2011. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan).* December 31.

San Francisco Estuary Institute (SFEI). 2011. *The Pulse of the Estuary: Pollutant Effects on Aquatic Life.* SFEI Contribution 660. San Francisco Estuary Institute, Richmond, CA.

San Francisco Estuary Institute (SFEI). 2012. "CD3 Contaminant Data Display & Download" website. Regional Monitoring Program Sediment Data, 1993 – 2010. Online: http://www.sfei.org/tools/wqt. Accessed on May 24, 2012.

Stevens, D. L. 2011. *Recommended Methods for Outlier Detection and Calculations of Tolerance Intervals and Percentiles- Application to RMP data for Mercury-, PCBs- and PAH-contaminated Sediments*. Prepared for Regional Monitoring Program for Water Quality in San Francisco Bay, Oakland CA.

U. S. Geological Survey (USGS). 1995. *7.5 Minute Quadrangle Topographic Map, San Francisco North, California.* 1:24,000 scale.

Uslu, B., Arcas, D., Titov, V. V. and A. J. Venturato. 2010. *A Tsunami Forecast Model for San Francisco, California.* NOAA OAR Special Report. March.

3.10 Land Use and Planning

3.10.1 Introduction

This section addresses potential impacts on land use and planning as a result of construction, operation, and maintenance of the project, as well as project compatibility with existing land uses and land use plans. The potential effects on land use and planning were evaluated to determine their level of significance as provided under the CEQA Guidelines. The significance criteria, as set forth in CEQA Guidelines Appendix G, are summarized in Table 3.10-1. As discussed in more detail below, no impacts related to land use and planning will occur, and no mitigation is required. For recreational uses, including recreation in San Francisco Bay, please see Section 3.15, Recreation.

TABLE 3.10-1
CEQA Checklist for Land Use and Planning
Embarcadero-Potrero 230 kV Transmission Project

X. LAND USE AND PLANNING Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☑
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☑

3.10.2 Regulatory Background and Methodology

3.10.2.1 Regulatory Background

The CPUC has primary jurisdiction over the project by virtue of its exclusive discretionary approval authority over construction, operation, and maintenance of public utility facilities. Because local governments do not have discretionary authority over this type of utility project, such projects are exempt from local land use and zoning regulations and discretionary permitting; ministerial permits will be secured, as required. However, as part of the CEQA impact assessment, PG&E considered federal, state, and local land use plans and policies to assess the project's general compatibility with land use and to assist with CEQA review.

Federal or Federal Delegated

Coastal Zone Management Act. The authority to evaluate projects conducted, funded, or permitted by the federal government is granted to coastal states through the federal Coastal Zone Management Act (CZMA) of 1972, United States Code (U.S.C.) Sections 3501 et seq., as amended in 1990 under the Coastal Zone Act Reauthorization Amendments. The CZMA requires that federal actions be consistent to the maximum extent practicable with federally approved state coastal plans. The project will require a permit (i.e., a federal action) from the U.S. Army Corps of Engineers (USACE) under the Clean Water Act and Rivers and Harbors Act because of the marine cable installation in San Francisco Bay. These permits are discussed further in Section 3.4, Biological Resources, and 3.9, Hydrology. The USACE is required to obtain a consistency determination from the San Francisco Bay Conservation and Development Commission (BCDC) to confirm that the project is consistent with the BCDC's amended coastal zone management program for San Francisco Bay (i.e., the San Francisco Bay Plan), as approved by the Department of Commerce.

State or State Delegated

McAteer-Petris Act (California GC Section 66000 et seq.). The McAteer-Petris Act of 1965 as amended directs BCDC to exercise its authority to issue or deny permit applications for placing fill, extracting materials, or changing the use of any land, water, or structure within the area of its jurisdiction, in conformity with the provisions and policies of both the McAteer-Petris Act and the San Francisco Bay Plan (BCDC, 2011). BCDC's jurisdiction includes the tidal waters of the Bay and a 100-foot shoreline band, salt ponds, managed wetlands, tidal marshes 5 feet above mean sea level, and certain named tributary waterways, such as rivers (California Government Code, *McAteer-Petris Act*, Section 66610, updated 2/26/2010). The BCDC adopted the San Francisco Bay Plan in 1968. It has been amended periodically since, with the latest amendments in 2011. BCDC has also adopted the San Francisco Waterfront Special Area Plan (2010), as well as the San Francisco Bay Area Seaport Plan (BCDC and MTC, 2012), as discussed below in Section 3.10.3, Existing Setting.

Port of San Francisco Waterfront Land Use Plan. In 1968, the State transferred its responsibilities for the San Francisco waterfront to the City and County of San Francisco through the Burton Act. As a condition of the transfer, the State required the City to create a Port Commission that has the authority to manage the San Francisco waterfront for the citizens of California. The Port is responsible for 7.5 linear miles of waterfront and adjacent seawall lots in the City and County of San Francisco stretching from Hyde Street Pier in the north to India Basin in the south. Onshore port jurisdictional lands are shown in Figure 3.10-1; PG&E operating under the understanding that based on conversations with staff at the Port and documentation from the State Lands Commission (Brian Bugsch, letter to PG&E, 2012) that all offshore portions of the project are also within Port jurisdiction. The Port's responsibilities include promoting commerce, navigation, and fisheries; restoring the environment; and providing public recreation. Although the Port is a department of the City and County of San Francisco, the Port receives no financial support from the City, and relies almost solely on its ability to generate revenues from the use of properties under its stewardship (Port of San Francisco, 2004, pg. 21). A Port license will be required for portions of the project that will be located on Port property, including the submarine portion of the line. These include a portion of the new 230 kV Potrero Switchyard area, the submarine cable, and a portion of the underground cable near the waterfront. The Port has jurisdiction over the Bay and waterfront lands in the vicinity of Piers 28 and 30, near the northern landing, and Pier 70 and 23rd Street near the southern landing.

The Port has developed a Waterfront Land Use Plan (2004) based on four bodies of law. These are:

- The Public Trust, under the Burton Act, as administered by the Port. The Port, as trustee, is required to promote commerce, navigation and fisheries, as well as to protect natural resources and develop recreational facilities for public use.
- The McAteer-Petris Act as administered by BCDC. BCDC and the Port work cooperatively because BCDC jurisdiction includes all of the piers and land on the Bay side of the Embarcadero.
- Proposition H as administered by the Port through the Waterfront Plan. Proposition H, passed by voters in 1990, launched the planning process leading to the plan, which contains specific policies and use limitations.
- The City and County of San Francisco General Plan and Planning Code as administered by the City Planning Commission and the Board of Supervisors. The City's General Plan contains policies affecting the waterfront. The Planning Code contains height, bulk, and use classifications, as well as criteria for conditional uses and variances (Port of San Francisco, 2004).

Local

City and County of San Francisco General Plan. The San Francisco General Plan contains 10 Area Plans that set specific policies and guidelines for certain neighborhoods in the city (San Francisco Planning Department, 2012a). The project area is located within the boundaries of three of these area plans: the Northeastern Waterfront Plan, of which South Beach Subarea is a part; the Rincon Hill Area Plan; and the Central Waterfront Plan. The General Plan does not contain a separate Land Use Element. Instead, policies regarding land use are found in various

Proposed Transmission Line

Substation/Switchyard

San Francisco Port Jurisdiction (On-land Portion Shown Only)

N

Scale: 1:20,000

0 1,000 2,000 Feet

FIGURE 3.10-1

San Francisco Port Jurisdiction Area

Embarcadero-Potrero 230 kV Transmission Project

San Francisco, CA

elements throughout the General Plan. The Embarcadero Substation and the underground transmission cable alignment down Folsom Street are located adjacent to the Transbay Redevelopment Project Area along Folsom Street (San Francisco Redevelopment Agency, 2005). The City of San Francisco is in the process of taking over management of the Transbay Redevelopment Area from the dissolved San Francisco Redevelopment Agency (City of San Francisco, 2012).

3.10.2.2 Methodology

Aerial photographs, area plans, land use maps, zoning ordinances, and redevelopment plans were reviewed for all areas traversed by the project. Existing land use was confirmed on the ground with San Francisco City and County Planning Department and Department of Public Works (DPW) personnel during a field reconnaissance trip. An initial meeting was held June 8, 2012 with BCDC staff to discuss the project. PG&E also conducted a field trip to review the project on June 27, 2012 with staff from the City and County of San Francisco and the Port. PG&E met with Port operations staff on July 2, 2012 and has been in continuing dialog with Port planning and real estate staff about the project.

3.10.3 Existing Setting

3.10.3.1 Existing Land Uses

Existing land uses in the project area are listed in Table 3.10-2, shown in Figures 3.10-2 and 3.10-3, and summarized below.

Northern Segment Land Uses. The segment of the project from Embarcadero Substation to the Bay follows city streets from the substation along Folsom Street to Spear Street, then south on Spear Street to its cul-de-sac near the Bay Bridge (Figure 3.10-2). The line then transitions to the Bay via a bore path to be installed by horizontal directional drilling (HDD).

Land uses along Folsom Street comprise a combination of commercial and residential uses, including apartment towers, parking lots, and the Temporary Trans Bay Terminal. Residential uses include Infinity Towers (a high-rise residential tower complex on Folsom and Spear Streets), apartments and condominiums. Commercial uses include parking lots, vacant land that is part of the Transbay Redevelopment Project Area, and commercial businesses and offices. The Temporary Transbay Terminal is found on the west side of Folsom Street, between Main and Beale Streets, and will be at that location through construction of the new Transbay Terminal, scheduled to be completed in 2017.

Occupying the south side of the block between Folsom and Harrison on Spear Street, is the Hills Plaza, a mixed-use center with residential condominiums on the top floors above restaurants, commercial offices, and retail businesses. The Hills Plaza also includes a private day care center, the Bright Horizons/Marin Day School Hills Plaza Campus. Other commercial enterprises along Spear Street include the Gap Inc. corporate headquarters; Digital Realty; various architect, engineer and artists' businesses; and a parking lot. Residential uses consist of apartment and condominium buildings, including the Infinity Tower at Spear Street and Folsom, and the Harbor Lofts, live/work lofts, at 400 Spear Street at the corner of Harrison. The Bay Bridge crosses Spear Street near the cul de sac at the eastern end of the street, with two adjacent commercial buildings.

The project would cross under The Embarcadero and into the Bay between Pier 28 and Pier 30/32, which house two restaurants, Hi Dive and the 100-year-old Red's Java House, respectively. Pier 28 houses various commercial businesses. Pier 30/32 is used primarily for parking, and is currently under construction for improvements needed to host the America's Cup. Port staff also report that Pier 30/32 is also used as an overflow location for cruise ships (Port of San Francisco, 2012a). Other buildings near the Embarcadero landing include residential units, some of which have ground-floor commercial uses.

Schools within 0.25 miles of the project alignment include two private day care centers, the MDS Hills Plaza location mentioned above and the Marin Day School Spear Street campus at 220 Spear Street between Folsom and Howard Streets, and the Youth Chance High School in the YMCA building at 169 Stuart.

TABLE 3.10-2
Zoning and Land Use Adjacent to Proposed Facilities
Embarcadero-Potrero 230 kV Transmission Project

Project Location	Zoning[1]	Existing Land Use
Embarcadero Substation	RH DTR – Rincon Hill Downtown Residential	Embarcadero Substation
Folsom between Fremont and Spear	P – Public RC-4– High Density Residential-Commercial Combined TB DTR – Transbay Downtown Residential	• Coppersmith building containing commercial offices • Pharmaceutical company with apartments above • Parking lots • Dimension7.com • Idea Couture • Gap Inc. corporate offices • Temporary Transbay bus terminal • Infinity Towers – residential towers with ground-floor restaurants, dentist • Vacant parcels in Transbay Redevelopment Project Area currently used for construction staging
Spear between Folsom and Harrison	RH DTR – Rincon Hill Downtown Residential RC-4 – High Density Residential-Commercial Combined	• Bright Horizons/Marin Day School Hills Plaza Campus • Hills Plaza – Apartments with ground-floor commercial including The Melt Restaurant, Hang Sang Press, Sports and Spine chiropractor, Crunch Fitness, Wharton/San Francisco business school, Hills Plaza Cleaners, Gordon Biersch • Infinity Towers – residential towers with ground-floor restaurants, dentist • Digital Realty
Spear between Harrison and Embarcadero	RH DTR – Rincon Hill Downtown Residential M-1 – Light Industrial M-2 – Heavy Industrial	• Gap Inc. corporate offices • Parking lot • Live/work lofts at Spear and Harrison • Offices with artists, engineers, architects • Bay Bridge footing
Embarcadero Landing	Pier 28 – M-1 – Light Industrial Pier 30/32 – M-2 – Heavy Industrial	• Pier 28 – Commercial offices, Hi Dive Restaurant • Pier 30/32 – Red's Java House, parking, currently under reconstruction for America's Cup improvements • Embarcadero – Pedestrian walkway • Bryant & Main – Apartments with ground-floor retail • Bryant & Beale - Apartments
New 230 kV Potrero Switchyard –23rd Street east of Illinois Street		
Potrero Landing on 23rd St.	PDR-1-G – Production, Distribution Repair, General M-2 –Heavy Industrial	• Potrero (now GenOn/Mirant) Power Plant • DHL facility
Landing to 23rd and Illinois	PDR-1-G – Production, Distribution Repair, General M-2 –Heavy Industrial	• Potrero (now GenOn/Mirant) Power Plant • DHL • Storage • Trans Bay Cable facility • American Medical Response emergency transport • Various PDR uses including Gino's Detail Service, Zonic Wholesale, American Industrial Center
New Potrero Switchyard Site	M-2 – Heavy Industrial	Utility: Part of GenOn Station A

Note:
[1] Zoning Map of the City and County of San Francisco; incorporates Board of Supervisor ordinances enacted through April 2012.

Proposed Transmission Line

Substation

N

Scale:
1:5,600

0 250 500 Feet

FIGURE 3.10-2

Embarcadero Area Existing Land Use

Embarcadero-Potrero 230 kV Transmission Project

San Francisco, CA

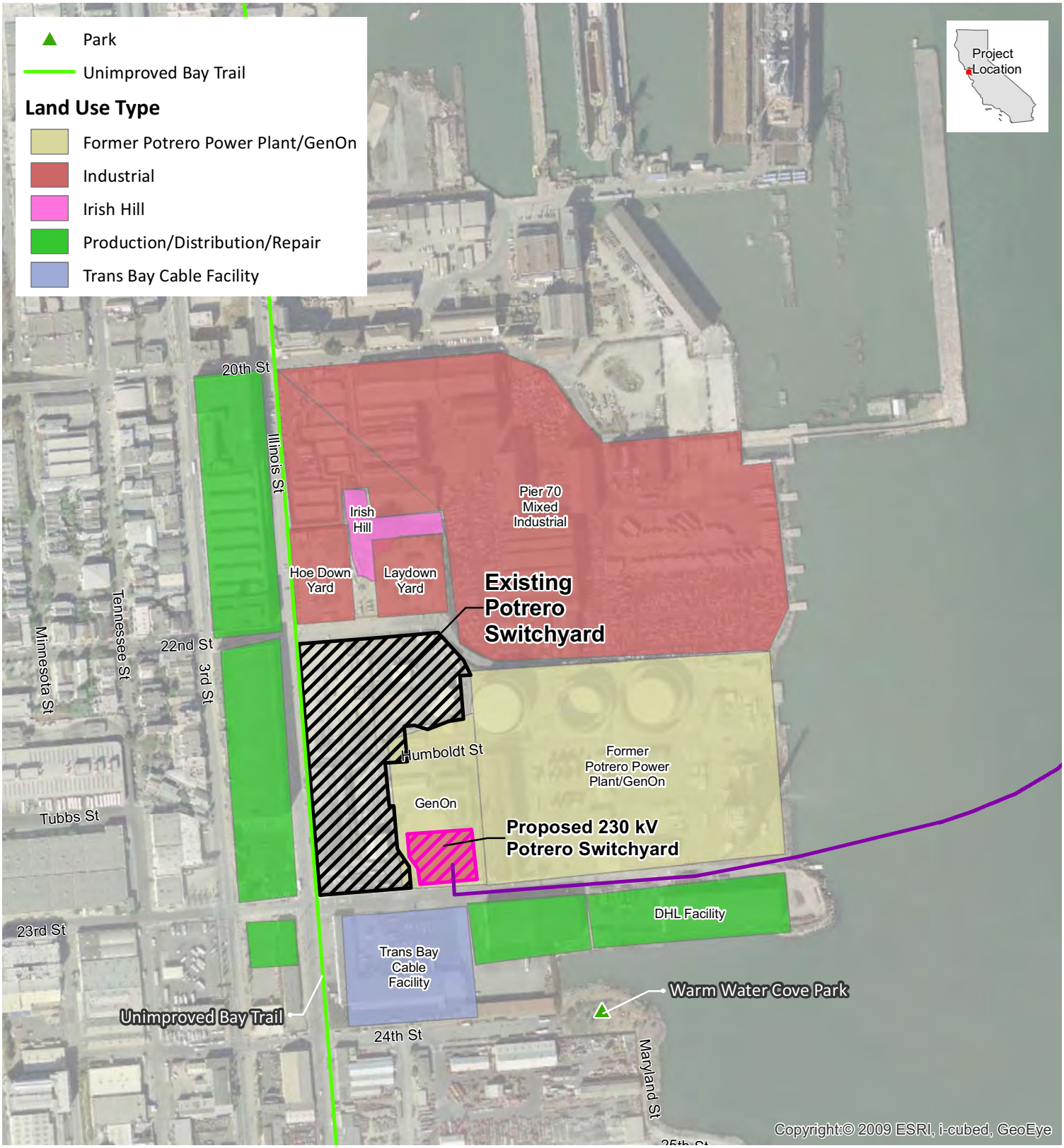


FIGURE 3.10-3
Potrero Area Existing Land Use
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

Marine Uses. The transmission line runs more than a quarter-mile offshore from Piers 30/32, past the marina at Pier 40 and the ballpark with its ferry terminal, south past Pier 70, and returns to land at 23rd Street. This portion of the Bay does not include anchoring areas and is inland from the shipping lanes and the Trans Bay Cable, as described further in Section 3.16, Transportation and Traffic.

Southern Segment Land Uses. On the southern segment, the project alignment transitions to land via HDD at 23rd Street, then runs along 23rd Street to the new 230 kV Potrero Switchyard on the GenOn property. Adjacent land uses consist of the DHL facility at 401 23rd Street, a storage facility, the Trans Bay Cable facility on the south side of 23rd Street, and the former Potrero Power Plant site now owned by GenOn on the north side of 23rd Street. American Medical Response and a building containing various production/distribution/repair (PDR) businesses are located across Illinois Street from the GenOn site.

No schools or hospitals are found along this segment of the project.

3.10.3.2 Planning Areas

The northern onshore segment of the project is located in the Downtown Neighborhoods area, as defined by the City of San Francisco General Plan, which includes the Rincon Hill and Northeastern Waterfront neighborhoods as well as the South Beach Subarea. The southern onshore segment of the project is located in the Central Waterfront Neighborhood, one of the Eastern Neighborhoods defined in the San Francisco General Plan. Figure 3.10-4 shows the geographic boundaries of these planning areas.

As detailed in Table 3.10-3, planning for both the Central Waterfront and the Northern Waterfront neighborhoods has been addressed in several documents by three different agencies: the City, Port, and BCDC. Each agency has given the planning areas different names, but all have essentially the same goals for improvement. This information is discussed in more detail in Section 3.10, Land Use and Planning, Subsection 3.3, Other Land Use Plans and Policies.

Rincon Hill Area Plan. The 12-block planning area for Rincon Hill is bounded generally by Folsom Street, the Embarcadero, Bryant Street, Beale Street, the Bay Bridge approach, and Essex Street. The Rincon Hill Area Plan (San Francisco Planning Department, 2005) is intended to transform Rincon Hill into a mixed-use downtown neighborhood with a significant housing presence, while providing the full range of services and amenities that support urban living. Under the Rincon Hill Area Plan, Folsom Street will become a grand civic boulevard through the Rincon Hill and Transbay neighborhoods with ground-floor neighborhood retail on both sides of the street (San Francisco Planning Department, 2005). The Rincon Hill Area Plan contains the following potentially relevant policies:

> *OBJECTIVE 1.3: Create space for additional uses to provide needed services for the resident population by transforming Folsom Street into a walkable neighborhood center to serve the Rincon Hill and Transbay neighborhoods.*
>
> *POLICY 1.7: Require ground-floor retail use along Folsom Street for no less than 75 percent of all frontages.*
>
> *POLICY 3.13: Require ground-floor retail use along Folsom Street for at least 75 percent of the street frontage.*
>
> *POLICY 5.3: Transform Folsom Street into a grand civic boulevard, per this plan and the Transbay Redevelopment Plan.*
>
> *POLICY 5.4: Widen sidewalks, narrow lanes and remove lanes, where feasible, on Harrison, First and Fremont Streets.*

The Transbay Terminal is also under development adjacent to this area, and the Draft Transit Center District Plan (San Francisco Planning Department, 2009) and the Redevelopment Plan for the Transbay Redevelopment Project Area (San Francisco Redevelopment Agency, 2005) also reflect this vision for Folsom Street and the surrounding area.

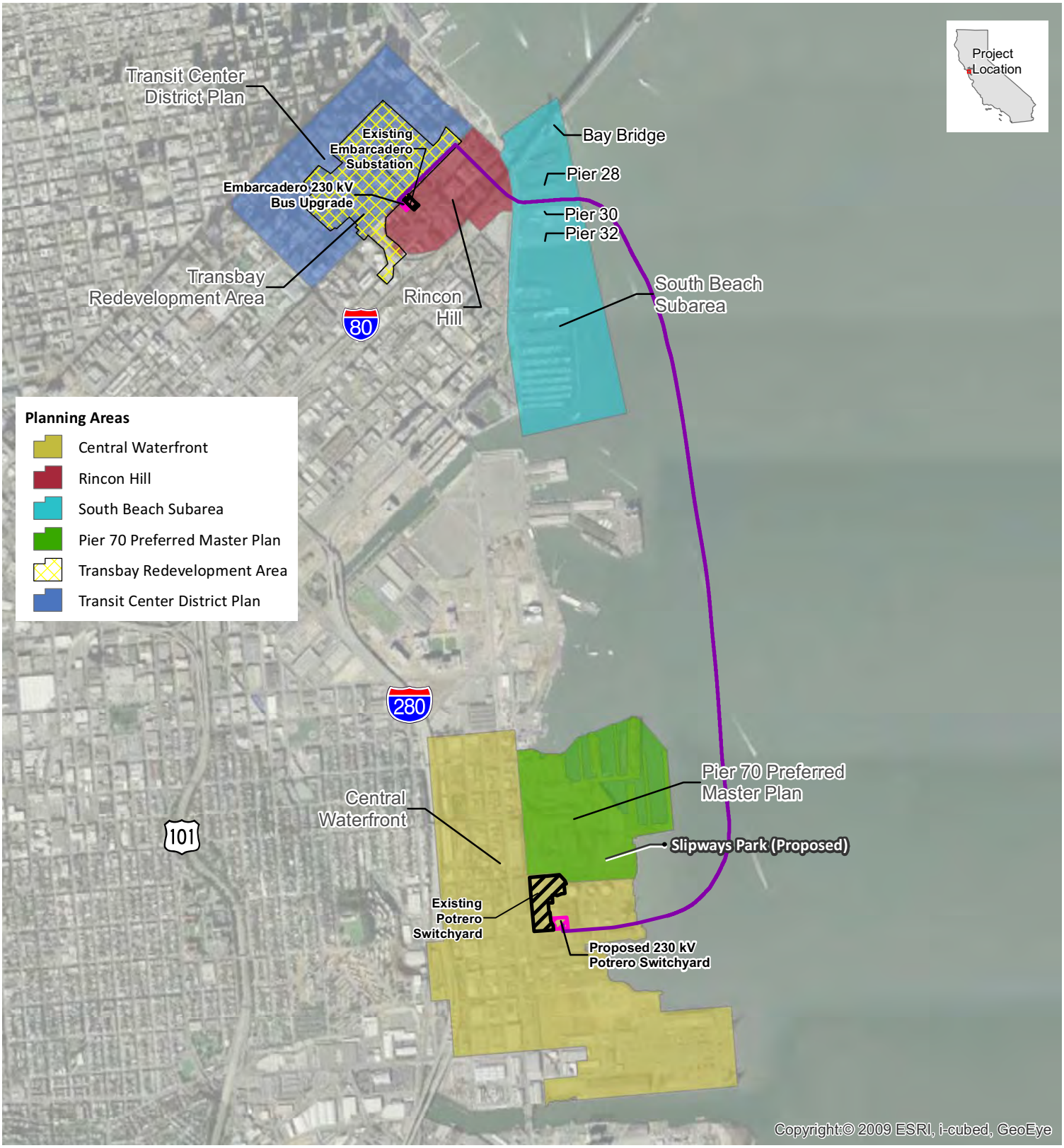


FIGURE 3.10-4
Planning Areas
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

TABLE 3.10-3

Area Plans and Planned Improvements in the Northeastern Waterfront and Central Waterfront Neighborhoods

Embarcadero-Potrero 230 kV Transmission Project

		Planning Area Name and Improvements	
Agency	**Plan**	**Northeastern Waterfront Neighborhood, South Beach Subarea**	**Central Waterfront Neighborhood**
City of San Francisco	Northeastern Waterfront Area Plan	South Beach Subarea Brannan Street Wharf	N/A
City of San Francisco	Central Waterfront Area Plan	N/A	Central Waterfront Neighborhood Bay Trail/Blue Greenway Pier 70 waterfront Pedestrian pathways linking Slipways Park and Pier 70 Irish Hill
City of San Francisco	Recreation and Open Space Element	Bay Trail Brannan Street Wharf PortWalk	Central Waterfront Neighborhood Bay Trail/Blue Greenway Pier 70 - public access and waterfront recreation Improved access to Warm Water Cove
BCDC	San Francisco Waterfront Special Area Plan	Northeastern Waterfront, South Beach Waterfront Brannan Street Wharf Brannan Street Wharf Open Water Basin PortWalk & Bayside History Walk Pier 32 improvements	Southern Waterfront, Central Basin Pier 70 - public access and waterfront recreation
Port of San Francisco	Waterfront Land Use Plan	South Beach/China Basin Waterfront Brannan Street Wharf Brannan Street Open Water Basin PortWalk & Bayside History Walk Bryant Street Mixed Use Opportunity Area	Southern Waterfront Pier 70 Mixed Use Opportunity Area Improved access to Warm Water Cove
Port of San Francisco	Pier 70 Preferred Master Plan	N/A	Pier 70 Slipways Park Irish Hill Power Plant Shoreline Access connection to Warm Water Cove Bay Trail/ Blue Greenway

Note:
N/A = Not applicable

Current land use consists primarily of many vacant parcels and some small residential and commercial buildings, including warehouses. Office and residential towers have recently been constructed near the waterfront. Residential towers (The Infinity residential development) in proximity to Embarcadero Substation are typical of new development under the Rincon Hill Area Plan (San Francisco Planning Department, 2005).

Embarcadero Substation is located within the boundaries of the Rincon Hill Area Plan in an area that is designated Rincon Hill Downtown Residential. The underground portion of the project will be installed through the planning area in Spear Street and Folsom Street, which divides the boundaries of the Rincon Hill Area Plan and the Transbay Redevelopment Project Area.

Northeastern Waterfront Area Plan/South Beach Subarea. The South Beach Subarea of the Northeastern Waterfront Area Plan generally extends along the waterfront from the Pier 22 Fire Boat House to just north of

AT&T Park. The Northeastern Waterfront Area Plan aims to capitalize on the area's proximity to the Bay to enhance the economic vitality of the area by encouraging redevelopment on and near the piers to provide enhanced public access and entertainment for residents. Currently, piers in this area encompass a mix of uses. Pier 36 was removed in 2012 to make room for a new Brannan Street Wharf, a project started in 2012 and expected to be completed in 2013. Pier 30/32 currently houses a public parking lot and a small restaurant, and has recently been proposed as a future bayside arena for the Golden State Warriors. The historic buildings on Piers 26 through 28 house a variety of businesses (San Francisco Planning Department, 2008a).

The HDD portion of the northern submarine cable landing will pass under a thin strip of the South Beach Subarea on the north side of Pier 30-32 before it transitions to the landing zone on Spear Street in the Rincon Hill area.

Central Waterfront Area Plan. The general boundaries of the Central Waterfront are from Mariposa Street south to Islais Creek and from Interstate 280 east to the Bay (San Francisco Planning Department, 2008b), and include the southern segment of the project. The Central Waterfront Area Plan envisions an area that accommodates both new housing and commercial services while maintaining both its role as an area of important economic activity and its mix of unusual uses. It also envisions improved livability with more welcoming streets and well-preserved historic structures. Central Waterfront land uses are almost entirely light to heavy industrial PDR uses, including maritime-related uses on Pier 70 as well as construction, transportation, warehousing/distribution, printing, and publishing.

The new 230 kV Potrero Switchyard and the southern underground segment of the cable are located east of Illinois Street within the Central Waterfront planning area in an area designated as "Pier 70 and Power Plant Site" on the Central Waterfront Area Plan's Generalized Zoning Districts Map (San Francisco Planning Department, 2008c). In order to protect the existing industrial and PDR business in the area, the Central Waterfront Plan's Generalized Zoning Districts Map recommends the following:

> *In areas controlled by the Port as well as the Potrero Power Plant site, maintain existing industrial zoning pending the outcome of separate planning processes for these areas.*

As discussed below, the Port's Pier 70 Preferred Master Plan (2010) broadens land use in the planning area from heavy industrial to encompass more mixed uses, including residential, office, biotech, commercial, research and development, and PDR uses. However, the new 230 kV Potrero Switchyard is located outside of the Pier 70 Preferred Master Plan area, and its zoning did not change with adoption of the Master Plan by the Port.

The new 230 kV Potrero Switchyard is zoned M-2 Heavy Industrial (San Francisco Planning Department, 2011a). The underground cable would be installed in 23rd Street through an area that is designated as M-2-Heavy Industrial in the existing zoning that is incorporated into the Central Waterfront Area Plan.

The Central Waterfront Plan includes the following policy relevant to the project:

> *POLICY 5.3.9. Explore opportunities to identify and expand waterfront recreational trails and opportunities including the Bay Trail and Blue-Greenway.*

The Bay Trail Plan, adopted by the Association of Bay Area Governments (ABAG), describes a 400-mile-long trail that encircles the Bay (ABAG, 1999). In addition, it should have continuous waterfront access unless the shoreline location clearly conflicts with active maritime use. The project will cross under the Bay Trail as buried cable at The Embarcadero near Pier 30/32. The Bay Trail will extend along Illinois Street in the vicinity of Pier 70 (San Francisco Board of Supervisors, 2011); therefore the southern end of the cable will not intersect the Bay Trail.

The Blue Greenway is a City-sponsored project that integrates with the Bay Trail to provide public recreation access to the Bay. The Port has taken the lead in directing the planning process between ABAG, State Parks, BCDC, and the San Francisco Recreation and Parks Department, and partial funding for the Blue Greenway was provided by the passage of Proposition A in 2008. On the southern end of the project, the Blue Greenway is integrated with the Bay Trail planning to provide access spurs to the waterfront at the future Slipways Park, which is planned at the end of 22nd Street (see discussion of the Pier 70 Preferred Master Plan below for more discussion of the Port's plans for this park). Access spurs are planned on 22nd Street and south from Slipways Park along the waterfront to connect with 24th Street (Port of San Francisco, 2011a and 2011b). Both

construction and operation of the project on 23rd Street will be compatible with development and recreational use of both the Bay Trail and the Blue Greenway.

The Eastern Neighborhoods Streets and Open Space Concept Map (adopted December 2008) is included in the Central Waterfront Area Plan. It is shown in Figure 3.10-5. The concept map shows an expanded Planned Open Space area at Warm Water Cove, which will stretch south to the end of 25th Street and north to the end of 23rd Street. The concept map also shows Illinois Street and 22nd Street and 24th Street as Green Connector Streets, and the shoreline at the end of 22nd Street is broadly defined as an area to "acquire and develop sites for open space or neighborhood parks in the general vicinity." The Eastern Neighborhoods Pedestrian / Bicycle / Traffic Calming Improvements Map (adopted December 2008), which is also part of the Central Waterfront Area Plan, shows improved pedestrian connections down 20th, 22nd, and 23rd Streets.

The project will not preclude development of additional open space along the waterfront and the establishment of a Green Connector Street along Illinois and 22nd Streets or future pedestrian improvements down 23rd Street. Given that project facilities would be located 40 feet underground, they would not conflict with above ground land uses. Therefore, over the long term, the project will not conflict with the Central Waterfront Area Plan. Project implementation activities would result in temporary traffic and circulation disturbances; see Section 3.15, Transportation and Traffic for more information.

3.10.3.3 Other Land Use Plans and Policies

In addition to the adopted area plans discussed above, the project crosses through several areas that have land use plans and policies adopted by the Board of Supervisors, the Port of San Francisco, and BCDC, as summarized in Table 3.10-3.

BCDC

Only the buried submarine cable and the HDD segments of the project are located in BCDC jurisdiction in the Bay. The cable crosses the 100-foot shoreline band underground, and the transition areas and vaults are located outside the 100-foot shoreline band.

San Francisco Bay Plan. BCDC, through the San Francisco Bay Plan, defines priority uses for the San Francisco Bay shoreline. According to the Bay Plan (Part IV, Developing the Bay and Shoreline: Findings and Policies), priority uses include ports, water-related industry, water-oriented recreation, airports, and wildlife refuges. The San Francisco Bay Plan does not have any policies that explicitly discuss power lines under the Bay floor. However, the "Other Uses of the Bay and Shoreline" section of Part IV, Development of the Bay and Shoreline: Findings and Policies, includes Policy 5b, which implies that a submarine cable would be compatible with the San Francisco Bay Plan:

Policy 5

5. *High voltage transmission lines should be placed in the Bay only when there is no reasonable alternative. Whenever high voltage transmission lines must be placed in the Bay or in shoreline areas:*

    a. *New routes should avoid interfering with scenic views and with wildlife, to the greatest extent possible; and*

    b. *The most pleasing tower and pole design possible should be used. <u>High voltage transmission lines should be placed underground as soon as this is technically and economically feasible</u>.* (BCDC, 2011; *<u>emphasis added</u>*.)

Source: City of San Francisco, 2008.

LEGEND

Proposed Transmission Line

FIGURE 3-10.5
Eastern Neighborhoods Streets and Open Space Concept Map
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

Siting Thermal Power Plants in BCDC Jurisdiction. In 2002, BCDC issued a report that provides guidance for siting thermal power plants and associated ancillary facilities, including underground and underwater electric transmission lines (BCDC, 2002). The document provides some guidance on where underwater transmission lines could be sited in accordance with the San Francisco Bay Plan. In the 2002 power plant siting report BCDC categorized the southern terminus of the project as a Category B "partially designated" area where, in certain circumstances, ancillary facilities of power plants could be sited without precluding or adversely affecting the existing and future use of these areas for their primary uses. Within Category B, the BCDC determined that underground or underwater electric transmission lines could be located within the surface waters of the Bay and existing and proposed public access "without creating impacts that could not be avoided or mitigated." However, developers would need to propose measures to reduce or eliminate any temporary construction impacts. Discussion of these impacts and Applicant Proposed Measures is included in Section 3.3, Air Quality; 3.7, Greenhouse Gases; and 3.16, Traffic and Transportation. The northern terminus of the project is not in an area that is designated (or even partially designated) for priority uses under the San Francisco Bay Plan. The project will be compatible with BCDC's San Francisco Bay Plan.

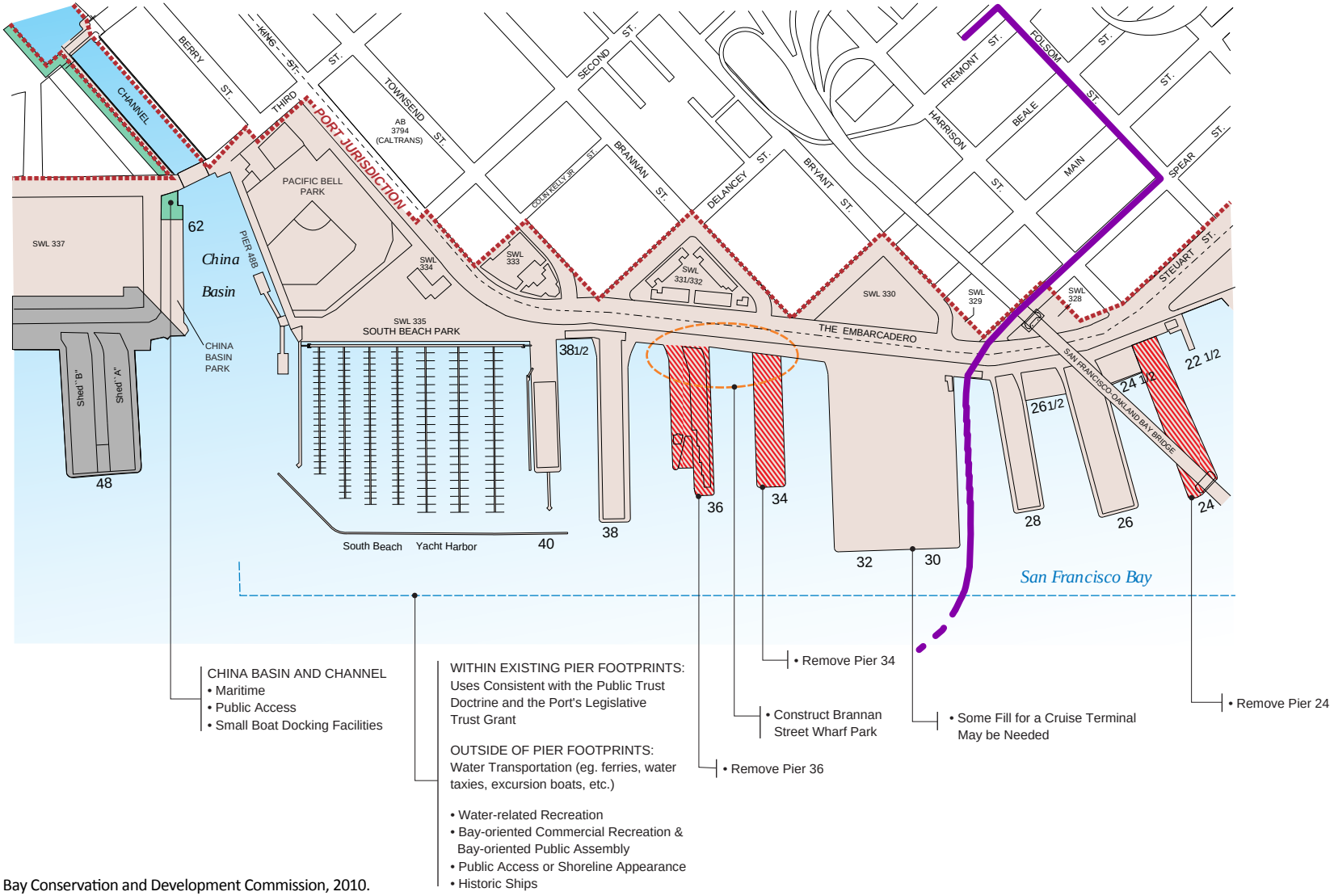
San Francisco Waterfront Special Area Plan. The submarine cable would traverses BCDC's San Francisco Waterfront Special Area Plan. This plan works to provide for and guide development of existing piers not otherwise designated for removal for uses consistent with the Public Trust Doctrine and the Port's legislative trust grant, and to reconcile the BCDC policies and the policies in the Port's Waterfront Land Use Plan, including its Design & Access Element, and the City's General Plan. This plan does not have any explicit policies regarding placement of utilities.

The San Francisco Waterfront Special Area Plan designates priority uses for certain areas of the San Francisco Bay shoreline. According to the San Francisco Bay Plan, the Embarcadero between Piers 28 and 32 and Potrero Point are not designated for priority uses (see Figure 3.10-6) (BCDC, 2010, Map 4). The portion of Pier 70 planning area affected by the project is not designated for any priority use (see Figure 3.10-7) (BCDC, 2010, Map 6).

There are three waterfront developments mentioned in the San Francisco Bay Plan:

- ***Brannan Street Wharf Open Water Basin.*** Open Water Basins, Policy 2d of the San Francisco Bay Plan, calls for the creation of a Brannan Street Wharf Open Water Basin between Piers 32 and 38, including the removal of Piers 34 and 36. Both Pier 34 and Pier 36 have been removed (Port of San Francisco, 2012a). Permitted uses of an Open Water Basin are water-related recreation, water transportation, limited public access, and at Pier 32 only, limited Bay-oriented commercial recreation and Bay-oriented public assembly. At Pier 32, berthing facilities for cruise ships may be allowed. The submarine cable will be located in the bay sediments outside of the Brannan Street Wharf Open Water Basin.
- ***Brannan Street Wharf.*** Public Plazas, Policy 1 calls for the creation of a new Brannan Street Wharf, a major waterfront park in the former area of Piers 34 and 36. Construction began in 2012 and is expected to be completed in 2013. Brannan Street Wharf is approved as a new 57,000-square-foot recreational wharf extending into the Bay. Brannan Street Wharf would be part of a proposed PortWalk, a continuous public access system between Pier 35 and China Basin. The submarine cable will be located approximately a quarter-mile from the future Brannan Street Wharf and will not affect development or use of the new wharf.
- ***Central Basin including Pier 70.*** The San Francisco Bay Plan states that the Central Basin should be developed for public access and waterfront recreation in accordance with the Recreation and Open Space Element of the City of San Francisco General Plan. Map 6 of the San Francisco Bay Plan shows an expansion of the Warm Water Cove north to Potrero Point. The project will not preclude development of increased public access and waterfront recreation at Pier 70.

The project will not conflict with priority use areas or planned developments in or adjacent to the project area; therefore the project is compatible with BCDC's San Francisco Waterfront Special Area Plan.



CHINA BASIN AND CHANNEL
- Maritime
- Public Access
- Small Boat Docking Facilities

WITHIN EXISTING PIER FOOTPRINTS:
Uses Consistent with the Public Trust Doctrine and the Port's Legislative Trust Grant

OUTSIDE OF PIER FOOTPRINTS:
Water Transportation (eg. ferries, water taxies, excursion boats, etc.)

- Water-related Recreation
- Bay-oriented Commercial Recreation & Bay-oriented Public Assembly
- Public Access or Shoreline Appearance
- Historic Ships

- Remove Pier 34
- Construct Brannan Street Wharf Park
- Some Fill for a Cruise Terminal May be Needed
- Remove Pier 36
- Remove Pier 24

Source: San Francisco Bay Conservation and Development Commission, 2010.

LEGEND

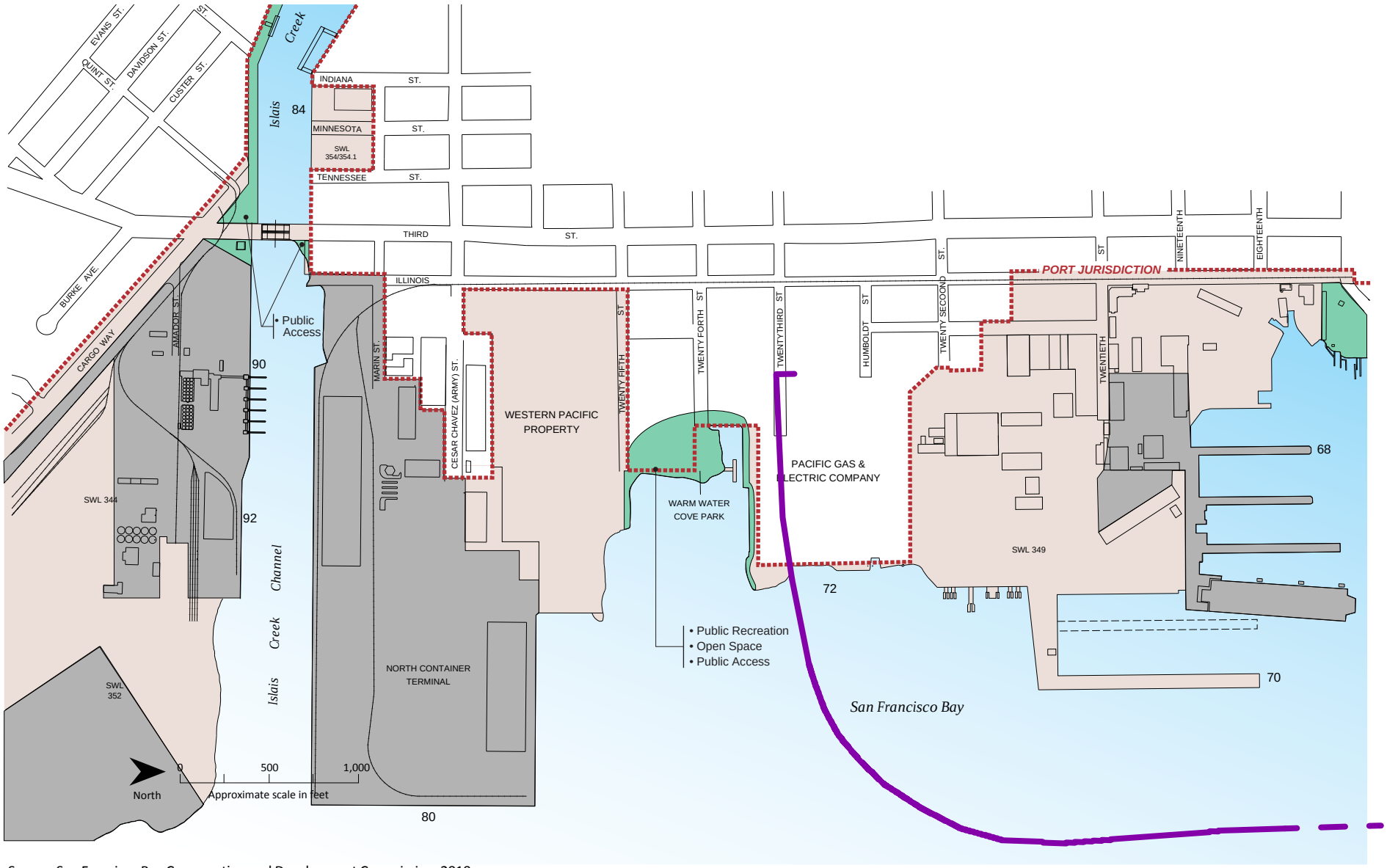
- Proposed Transmission Line
- Port Priority Area
- Public Recreation And Access

North

0 500 1,000

Approximate scale in feet

FIGURE 3-10.6
BCDC San Francisco Waterfront Special Area Plan Map 4
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA



Source: San Francisco Bay Conservation and Development Commission, 2010.

LEGEND

- Proposed Transmission Line
- Port Priority Area
- Public Recreation And Access

FIGURE 3-10.7
BCDC San Francisco Waterfront Special Area Plan Map 6
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

San Francisco Bay Area Seaport Plan. The Seaport Plan (BCDC and MTC, 2012) designates port priority use areas as areas to be protected for marine terminals and other directly related uses (Findings and Policies Concerning Ports on the Bay, Policy #3 [BCDC, 2012]). There are no port priority use areas designated in the vicinity of Pier 30/32 on the northern end of the submarine cable. The Seaport Plan designates the northernmost portion of Pier 68/70 north of 20th Street as a port priority use area for ship repair, and the area has a channel depth of 40 feet. All project facilities are located outside of this priority use area; the submarine cable crosses approximately 1,500 feet offshore from Pier 68/70. PG&E is working with the Port to ensure that the submarine cable will be installed deep enough such that no port priority uses will be affected. Therefore, the project will be compatible with the San Francisco Bay Area Seaport Plan.

San Francisco General Plan

Recreation and Open Space Element. In addition to the relevant neighborhood plans discussed above, the Recreation and Open Space Element of San Francisco's General Plan includes the following policy:

> *POLICY 2.8. Develop a recreational trail system that links city parks and public open space, ridge lines and hilltops, the Bay and ocean, and neighborhoods, and ties into the regional hiking trail system.*

The Regional Open Space System described in the Recreation and Open Space Element states that the Bay Trail should traverse the eastern edge of the City and link a number of waterfront parks and open spaces. The Recreation and Open Space Element also calls for improved public access to Warm Water Cove, located at the east end of 24th Street:

> *POLICY 3.5. Provide new public open spaces along the shoreline.*
>
> *Eastern Shoreline, Warm Water Cove. As opportunities arise, extend the park to the north bank of the channel along the shoreline in front of the PG&E facility. When and if that facility is deactivated, give priority to expanding the public open space along the shoreline* (San Francisco Planning Department, 2010).

The southern HDD segment will cross under the proposed shoreline access from the north to Warm Water Cove in front of the former PG&E Potrero Power Plant (now owned by GenOn). The project will not affect the Bay Trail or preclude expansion of public access at Warm Water Cove, and is therefore compatible with the Recreation and Open Space Element of the General Plan.

Port of San Francisco Planning Documents

The segments of the project that are located in Port jurisdiction traverse various Port planning areas. Specifically, the northern landing zone of the submarine cable and the first few hundred feet of the underground cable in Spear Street will be within Port jurisdiction. PG&E understands through its discussions with the Port and the State Lands Commission that the entire submarine portion of the project will be in Port jurisdiction. On the southern end of the project, a portion of the new Potrero Switchyard, the landing zone, and most of the underground cable in 23rd Street will be installed through Port jurisdiction. The underground cable along 23rd Street transitions out of Port jurisdiction through a small piece of the GenOn site just south of the proposed switchyard, for approximately 200 feet.

Waterfront Land Use Plan. The Waterfront Land Use Plan (Port of San Francisco, 2004) is the culmination of a planning process designed to guide the future development of Port lands. The Waterfront Land Use Plan identifies areas where public access to the waterfront should be enhanced. The Waterfront Land Use Plan does not specifically address underground or submarine transmission lines.

Primary goals for future development are to continue to meet the needs of maritime industry, encourage new investment, and host a diverse array of maritime, commercial, entertainment, civic, open space, recreation, and other activities. The Waterfront Land Use Plan calls for, among other goals, the creation of a PortWalk and Bayside History Walk along the Embarcadero and piers, and coordinating access with and, where feasible, implementing the Bay Trail.

In the northern portion of the project site, the South Beach/China Basin Waterfront is a subarea plan of the Waterfront Land Use Plan. It identifies the Bryant Street Mixed Use Opportunity Area, which includes Piers 30-32 and Seawall Lot 330, as an area for potential development, including the potential for berthing ships, public entertainment, and a portion of the PortWalk. The site has been identified by the Port as a possible future cruise terminal. Port staff report that Piers 30/32 are currently used as an overflow location for cruise ships, and the Port periodically dredges to 40 feet in the area (Port of San Francisco, 2012a). The Port Plan also calls for the removal of Piers 34 and 36 to create the Brannan Street Open Water Basin and Brannan Street Wharf (Port of San Francisco, 2012b), a project being completed in 2012. The Port Plan designates the pedestrian walkway on the Bay side of the Embarcadero (part of the Bay Trail) as "Other Public Access and Open Space Areas." The submarine cable and northern HDD segment of the project will pass under the Embarcadero to the north of the Bryant Street Mixed Use Opportunity Area and will be compatible with current uses and future plans for these areas. In addition, the project will not interfere with current surface land uses, and is designed to allow, wherever feasible, 40-foot dredging depth limits. PG&E and the Port of San Francisco have agreed to a term sheet governing the issuance of a license for the project from the Port, in which the parties addressed the Port's dredging requirements. That agreement provides that in the HDD portions of the License Area, the Port may dredge up to a depth of forty feet below mean lower low water (MLLW) in the HDD portions of the License Area, if the Port reasonably determines dredging to such depth is required to support or advance maritime operations and use within Port jurisdiction; the Port will not dredge within five vertical feet of the HDD conduits. As part of that agreement, PG&E will put the HDD as near to the bedrock surface as possible to allow dredging.

All project facilities will be located outside of the boundaries of the Waterfront Land Use Plan in the Southern Waterfront (Port of San Francisco, 2004, p. 163A).

Pier 70 Preferred Master Plan and Slipways Park. Adopted by the Port in April 2010, the Pier 70 Preferred Master Plan broadens land use in the planning area from heavy industrial to encompass more mixed uses, including residential, office, biotech, commercial, research and development and production, distribution and repair uses.

The Pier 70 Preferred Master Plan calls for the creation of Slipways Park along the waterfront edge of Pier 70. The four existing slipways will be enhanced as a series of outlooks extending into the Bay. The park design includes trail connections to Warm Water Cove through the Power Plant Shoreline Access to the south and street connections to 20th and 22nd Streets to the west. The Power Plant Shoreline Access would round the point from the shoreline on 23rd Street and connect to the end of 24th Street. This would, in turn, follow 24th Street to connect with the Blue Greenway/Bay Trail (Port of San Francisco, 2011b). The Pier 70 Preferred Master Plan has the following objective:

> *OBJECTIVE 3. Integrate the Bay Trail, the Bay Water Trail, and the Blue Greenway into the design of the Pier 70 open space network, which creates an inter-connected path that links public open spaces along the shoreline, includes areas that support natural habitat for wildlife, and provides access into or on the Bay.*

The new 230 kV Potrero Switchyard and the associated HDD landing and underground segment on 23rd Street will be located outside of the planning area for Pier 70 and the cable will not traverse the future Slipways Park, though the HDD segment would be drilled under the future shoreline access between Slipways Park and Warm Water Cove. Nevertheless, given that project facilities would occur below the ground surface, a conflict with the provisions of Objective 3 would not occur.

3.10.3.4 Zoning Designations

The zoning designations for the land surrounding the onshore portions of the transmission line route are shown in previous Table 3.10-2.

The following zoning designations apply to the proposed Potrero Switchyard and existing Embarcadero Substation sites:

Heavy Industrial. These districts are the least restricted in terms of development feasibility and are located at the eastern edge of the City, separated from residential and commercial areas. The new Potrero Switchyard location is zoned M-2—Heavy Industrial, and development of a new switchyard will be compatible with the current zoning.

Rincon Hill Downtown Residential. This is a mixed-use district combining residential and commercial uses. The Rincon Hill Plan designates Folsom Street as a walkable neighborhood center. It allows for existing industrial, service, and office uses to remain but requires any major redevelopment to incorporate housing. In this area, the project will include installation of additional equipment within the existing Embarcadero Substation and underground cable located in city streets, which is not considered a major development. Therefore, the project will be compatible with the current zoning. Given that off shore locations do not receive zoning designations, implementation of the submarine portion of the project would not result in a land use conflict.

3.10.4 Applicant-Proposed Measures and Potential Impacts

3.10.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, and as summarized in Table 3.10-1, impacts to land use may be considered significant if the project would physically divide an established community; conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project; or conflict with any applicable habitat conservation plan or natural community conservation plan.

3.10.4.2 Applicant-Proposed Measures

The project will have no impact to land use and planning. However, to further reduce short-term disturbance to the surrounding neighborhoods [during construction], PG&E is proposing the following applicant-proposed measures (APMs).

APM Land Use (LU)-1. Provide Construction Notification and Minimize Construction Disturbance. A public liaison representative will provide the public with advance notification of construction activities, between two and four weeks prior to construction. The announcement shall state specifically where and when construction will occur in the area. Notices shall provide tips on reducing noise intrusion, for example, by closing windows facing the planned construction. PG&E shall also publish a notice of impending construction in local newspapers, stating when and where construction will occur.

All construction activities will be coordinated with the City and Port of San Francisco at least 30 days before construction begins in these areas. Work will be coordinated to minimize any potential conflicts with other construction or recreational projects.

APM LU-2. Provide Public Liaison Person and Toll-Free Information Hotline. PG&E shall identify and provide a public liaison person before and during construction to respond to concerns of neighboring residents about noise, dust, and other construction disturbance. Procedures for reaching the public liaison officer via telephone or in person shall be included in notices distributed to the public as described above. PG&E shall also establish a toll-free telephone number for receiving questions or complaints during construction.

3.10.4.3 Impacts

a) Would the project physically divide an established community? *No Impact.*

As detailed above, the project's transmission facilities will be located underground and in the Bay and would not physically divide an established community. Construction of the new Potrero Switchyard will occur in an already industrialized area and will not divide an established community; therefore no impact will occur.

b) Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? *No Impact.*

As detailed above, the project is exempt from local land use and zoning regulations and permitting, so local land use plans are not applicable to the project. Nonetheless, an evaluation was performed and the impact analysis above demonstrates that the project is compatible with land use plans, policies, and regulations adopted by the City, the Port, or BCDC in the project area. As detailed below, installation of the underground cable will occur primarily within PG&E's franchise

area in city streets and will not have a long-term impact on surrounding neighborhoods. The new 230 kV Potrero Switchyard will be located within a surrounding landscaped wall on appropriately zoned land in an industrial area adjacent to similar land uses. Therefore there will be no impact to land use and the project will not conflict with any applicable land use plans.

Commercial, industrial, and residential uses located on 23rd Street in the south, and on Spear and Folsom Streets in the north, may be affected by noise, dust, odors, access restrictions, and increased traffic during HDD activities and in-street trenching.] Temporary construction noise and dust will be reduced through measures described in Section 3.3, Air Quality, and Section 3.12, Noise; impacts will be less than significant. Traffic impacts and applicant-proposed measures are addressed in Section 3.17, Transportation and Traffic, and all impacts will be temporary, short-term, and less than significant. As detailed in Section 3.17, Transportation and Traffic, access to residences and businesses will be maintained during construction through temporary plating or night construction as determined in coordination with the City. As detailed in the APMs, PG&E will further reduce short-term disturbance to the surrounding neighborhoods by providing written notice prior to commencing construction in these areas and providing a public-liaison representative to address concerns.

The underground portion of the line will be inspected regularly from inside the vaults; therefore, inspections will not disturb adjacent land uses. Any minor impacts to traffic associated with working in the vaults are addressed in Section 3.17, Transportation and Traffic.

Rincon Hill

On the northern end of the project, the underground cable will be installed in Spear and Folsom Streets in the Rincon Hill planning area. Placement of the cable in city streets will not adversely affect future development of the neighborhood as mixed-use residential with ground-floor commercial uses. All construction activities required to connect the new 230 kV cable to the existing Embarcadero Substation will occur within existing property boundaries and there will be no effect to existing or planned land use associated with the project.

Northeastern Waterfront

In the Northeastern Waterfront, project facilities will include a buried cable passing north of Pier 30/32 and under The Embarcadero. The submarine cable will be located in the bay sediments outside of the Brannan Street Wharf Open Water Basin and approximately a quarter-mile from the future Brannan Street Wharf; and it will not affect these areas due to the project's spatial distance from these locations. Installation of the cable via HDD north of Pier 30/32 will not affect redevelopment or use of the pier, nor will it affect the Port's ability to develop the Bryant Street Mixed Use Opportunity Area, given that project facilities would be located below the ground surface. PG&E is working with the Port to ensure the cable will be drilled or buried deeply enough within Berth 30 and in the rest of the route to avoid impacts to dredging activities or berthing vessels.

The HDD rig and staging area on the northern segment of the transmission cable are located along Spear Street and will not affect use or development of the PortWalk or Bayside History Walk. The transmission line will be installed via HDD under these areas and will have no impact. The cable will not conflict with existing land uses or state and local land use plans and policies in the Northeastern Waterfront area.

Central Waterfront

On the southern end of the project in the Central Waterfront, the underground transmission line will be drilled under the shoreline area and will have no impacts on use of the shoreline area for public access once in place. Currently, there is no public access at the transition location on the extension of 23rd Street, and the underground cable would not affect a future improved pedestrian connection down 23rd Street. The buried underground and submarine transmission line will not affect water-dependent activities or be incompatible with future efforts to improve public access to Pier 70 or Warm Water Cove. Existing access to Warm Water Cove is along 24th Street and would not be affected by the project. The buried transmission line will not affect future development of the Bay Trail system or the Blue Greenway. Project implementation would result in various temporary impacts. These impacts, along with Applicant Proposed Measures are discussed in detail in Section 3.3, Air Quality; 3.7, Greenhouse Gases; and 3.16, Traffic and Transportation.

The transmission line will be installed in 23rd Street, outside of the planning area for the Pier 70 Preferred Master Plan and Slipways Park and there will be no direct impact to the planning area. The main access to the park will be on 22nd Street and it will not be affected by the project.

Potrero Switchyard Site. The new Potrero Switchyard will not be located within BCDC jurisdictional areas. While a portion of the site is located in an area managed by the Port, it is not located within the planning area of either the Waterfront Land Use Plan or the Pier 70 Preferred Master Plan.

The switchyard will be constructed with a surrounding landscaped wall, similar to facilities found on the opposite side of 23rd Street along the Trans Bay Cable facility, and is compatible with other current or planned industrial or mixed use developments in the area. The site is zoned for Heavy Industrial and development of a new switchyard at the site will be compatible with existing land use and land planning and zoning in the area. Therefore there will be no impact.

c) Would the project conflict with any applicable habitat conservation plan or natural community conservation plan? *No Impact.*

No habitat conservation plan or natural community conservation plans cover the project area; therefore no impact will occur.

3.10.5 References

Association of Bay Area Governments (ABAG). 1999. "San Francisco Bay Trail—History" website. Online: http://www.baytrail.org/history.html. Accessed May, 28, 2012.

Bugsch, Brian. 2012. Letter from Brian Bugsch, Chief, Land Management Division, State Lands Commission, to PG&E senior planner Bob Donovan. July 10, 2012.

California Government Code. 2010. San Francisco Bay Conservation and Development Commission (McAteer-Petris Act), Title 7.2, Chapter 2. Definition of San Francisco Bay, Section 66610. 1965. Last Update 2/26/2010. Online: http://www.bcdc.ca.gov/laws_plans/mcateer_petris.shtml. Accessed July 5, 2012.

City of San Francisco. 2012. "Transfer of Redevelopment Agency to City and County of San Francisco" website. Online: http://www.sfredevelopment.org/. Accessed May 29, 2012.

Pacific Gas and Electric Company (PG&E). 2009. *PG&E's 2009 Electric Transmission Grid Expansion Plan*. March. 876 pp.

Port of San Francisco. 2004. *Waterfront Land Use Plan.* Republished version, June 2004. Accessed May 16, 2012.

Port of San Francisco. 2010. *Pier 70 Preferred Master Plan.* April.

Port of San Francisco. 2011a. *Blue Greenway Planning and Design Guidelines, Revised Draft for Public Review.* Online: http://www.sf-port.org/Modules/ShowDocument.aspx?documentid=1907. June.

Port of San Francisco. 2011b. *Blue Greenway Planning and Design Guidelines, Revised Draft for Public Review. "*Pier 70 Slipways Park – Site 13" Map*.* Online: http://www.sf-port.org/Modules/ShowDocument.aspx?documentid=1907. Page 2.9. June.

Port of San Francisco. 2012a. Meeting with PG&E and Port engineers Mabel Bhat and Kenneth Chu.

Port of San Francisco. 2012b. "Brannan Street Wharf" website. Online: http://www.sfport.com/index.aspx?page=262. Accessed June 3, 2012.

San Francisco Bay Conservation and Development Commission (BCDC). 2002. *Siting Thermal Power Plants in the Jurisdiction of the San Francisco Bay Conservation and Development Commission.* December 5.

San Francisco Bay Conservation and Development Commission (BCDC). 2010. *San Francisco Waterfront Special Area Plan.* Online: http://www.bcdc.ca.gov/pdf/sfwsap/SFWSAP_Final.pdf. April 1975 as amended through February 2010.

San Francisco Bay Conservation and Development Commission (BCDC). 2011. *San Francisco Bay Plan*. Online: http://www.bcdc.ca.gov/laws_plans/plans/sfbay_plan.shtml. Initially adopted in 1968; last updated October 2011.

San Francisco Bay Conservation and Development Commission (BCDC). 2012. *San Francisco Bay Area Seaport Plan.* April 18, 1996 as amended through January 2012. Online: http://www.bcdc.ca.gov/pdf/seaport/seaport.pdf.

San Francisco Bay Conservation and Development Commission (BCDC) and Metropolitan Transportation Commission (MTC). 2012. *San Francisco Bay Area Seaport Plan.* April 18, 1996 as amended through January 2012. Online: http://www.bcdc.ca.gov/pdf/seaport/seaport.pdf.

San Francisco Board of Supervisors. 2011. *Citywide Recreation and Open Space Element, Citywide Recreation and Open Space Plan Map 4.* Online: http://www.sf-planning.org/ftp/General_Plan/images/I3.recreation_openspace/ros_map4.pdf. Accessed December 22, 2011.

San Francisco Planning Department. 2005. *Rincon Hill Area Plan.* Online: http://www.sf-planning.org/ftp/General_Plan/Rincon_Hill.htm. As amended May 25, 2005.

San Francisco Planning Department. 2008a. *Northeastern Waterfront Area Plan.* Online: http://www.sf-planning.org/ftp/General_Plan/NE_Waterfront.htm. December.

San Francisco Planning Department. 2008b. *Central Waterfront Area Plan.* Online: http://www.sf-planning.org/ftp/General_Plan/Central_Waterfront.htm. December.

San Francisco Planning Department. 2008c. *Central Waterfront Area Plan, Generalized Zoning District Map.* Online: http://www.sf-planning.org/ftp/General_Plan/images/central_waterfront/cw_map2.pdf. December.

San Francisco Planning Department. 2009. *Transit Center District Plan, Draft for Public Review.* November.

San Francisco Planning Department. 2010. *San Francisco General Plan, Recreation and Open Space Element.* Online: http://www.sf-planning.org/ftp/General_Plan/I3_Rec_and_Open_Space.htm. As amended through June 3, 2010.

San Francisco Planning Department. 2011a. *Eastern Neighborhoods Map Cleanup Legislation, Zoning Map,* July 2011.

San Francisco Planning Department. 2011b. *San Francisco General Plan, Recreation and Open Space Element, Map 5*, *San Francisco Bay Trail Project status as of 2011.*

San Francisco Planning Department. 2011c. *Pier 36/Brannan Street Wharf Project, Draft Environmental Impact Report.* February 9.

San Francisco Planning Department. 2011d. *The 34th America's Cup & James R. Herman Cruise Terminal and Northeast Wharf Plaza Draft EIR.* July 11.

San Francisco Planning Department. 2012a. "San Francisco General Plan" website. Online: http://www.sf-planning.org/ftp/General_Plan/index.htm.

San Francisco Planning Department. 2012b. *San Francisco Planning Code, Article 8, Mixed Use Districts, Section 827, Rincon Hill Downtown Residential Mixed Use District (RH-DTR).* June 23.

San Francisco Redevelopment Agency. 2005. *Redevelopment Plan for the Transbay Redevelopment Project Area.* Ordinance No. 124-05, adopted June 21, 2005.

3.11 Mineral Resources

3.11.1 Introduction

This chapter evaluates the potential for the project to impact the availability of mineral resources. The most significant mineral resources of the San Francisco Peninsula are non-metallic mineral commodities, primarily crushed and broken stone products. Although active and abandoned commercial rock quarries are present in the southern portion of the peninsula on San Bruno Mountain and the coastal hills surrounding the San Andreas and Crystal Springs valleys, no commercial quarries exist within the project area. No economic deposits of metallic minerals are known to exist within the project area. The San Francisco General Plan (San Francisco Planning Department, 1996) states that mineral resources are not found to any appreciable extent in San Francisco and they are consequently omitted from the plan.

The proposed project's potential effects on mineral resources were evaluated to determine their level of significance as provided under the CEQA Guidelines. The significance criteria, as set forth in CEQA Guidelines Appendix G, are summarized in Table 3.11-1. As discussed in more detail below, since no known mineral resources of value are found along or adjacent to any portion of the project route, no applicant-proposed measures are proposed for this project. No potential impacts will occur to mineral resources, and no mitigation is required.

TABLE 3.11-1
CEQA Checklist for Mineral Resources
Embarcadero-Potrero 230 kV Transmission Project

IX. MINERAL RESOURCES **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporation**	**Less than Significant Impact**	**No Impact**
a) Result in the loss of availability of a known mineral resource classified MRZ-2 by the State Geologist that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☑

3.11.2 Regulatory Background and Methodology

3.11.2.1 Regulatory Background

California Surface Mining and Reclamation Act of 1975 (SMARA). The primary state law concerning conservation and development of mineral resources is the California Surface Mining and Reclamation Act of 1975, as amended (SMARA). SMARA is found in the California Public Resources Code (PRC), Division 2, Chapter 9, Sections 2710 et. seq. SMARA was enacted in 1975 to limit new development in areas with significant mineral deposits. Under SMARA, lands are classified California based on mineral resource availability.

Mineral Resource Classification. The former California Division of Mines and Geology (CDMG; now the California Geological Survey [CGS]) classified the regional significance of mineral resources in accordance with the SMARA. Mineral Resource Zones (MRZs) delineated by the CDMG identify the presence and significance of mineral deposits and are defined as follows:

- **MRZ-1.** Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence
- **MRZ-2.** Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence
- **MRZ-3.** Areas containing mineral deposits, the significance of which cannot be evaluated from available data

- **MRZ-4.** Areas where available information is inadequate for assignment to any other MRZ
- **SZ.** Areas containing unique or rare occurrence of rocks, minerals, or fossils that are of outstanding scientific significance

3.11.2.2 Methodology

The analysis of the potential for project impacts to mineral resources included a review of available maps, technical publications, and other relevant publications characterizing the project area (Bailey and Harden, 1975; San Francisco Planning Department, 1996 and 2011; Stinson et al., 1986). The proposed project's effects were evaluated as provided under the CEQA Guidelines to determine the level of significance of the impacts anticipated from the proposed project.

3.11.3 Existing Setting

The project is located within an urbanized area of San Francisco. All land in San Francisco, including the project site, has been classified MRZ-4, indicating that available information is inadequate for assignment to any other MRZ. As such, the site is not a designated area of significant mineral deposits. The project is located generally in fill or Bay muds. The existing urban development of the project area precludes further exploration for mineral resources or extraction of any potential resources. Economically viable sources of rock materials, as identified by CDMG, are not mapped along or adjacent to any portion of the project route.

3.11.4 Applicant-Proposed Measures and Potential Impacts

3.11.4.1 Significance Criteria

Project impacts on mineral resources were evaluated against the CEQA significance criteria, as discussed below. In accordance with Appendix G of the CEQA Guidelines, impacts to mineral resources may be considered significant if they result in the loss of availability of a known mineral resource that would be of value to the region and state, or of a locally important mineral resource recovery site, as discussed below and shown in Table 3.11-1 above.

3.11.4.2 Applicant-Proposed Measures

Since economically viable sources of rock materials are not mapped along or adjacent to any portion of the project route, no mineral resource-related Applicant-Proposed Measures are proposed for this project.

3.11.4.3 Construction, Operation, and Maintenance Impacts

No potential impacts will occur to mineral resources as a result of the project, as discussed below.

a) Would the project result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state? ***No impact.***

The entirety of the project is located in an area that is not known to contain mineral resources and is categorized as MRZ-4. No mapped Mineral Resource Zones are located along the project alignment.

b) Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? ***No impact.***

The project would not result in the loss of availability of a locally important mineral resource recovery site; therefore, no impact will occur.

3.11.5 References

Bailey, E.H., and D.R Harden. 1975. Map Showing Mineral Resources of the San Francisco Bay Region, California – Present Availability and Planning for the Future. United States Geological Survey, Miscellaneous Investigations Series, Map I-909, 1 sheet, scale 1:250,000.

San Francisco Planning Department. 1996. *San Francisco General Plan.* June 27.

San Francisco Planning Department. 2011. *Land Use Index of the General Plan of the City and County of San Francisco.* August.

Stinson, M.C., M.W. Manson, and J.J. Plappert. 1986. *Mineral Land Classification: Aggregate Materials in the San Francisco – Monterey Bay Area*. California Division of Mines and Geology (CDMG) Special Report 146. State of California Department of Conservation.

3.12 Noise

3.12.1 Introduction

This chapter describes the noise-sensitive receptors and identifies potential noise-related impacts that are associated with implementation of the project. Noise-sensitive receptors are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the designated use of the land. Typically, noise-sensitive land uses include uses such as residences, hospitals, places of worship, libraries, and schools, as well as nature and wildlife preserves and parks.

The proposed project's potential noise-related effects were evaluated to determine their level of significance as provided under the CEQA Guidelines. The significance criteria, as set forth in CEQA Guidelines Appendix G, are summarized in Table 3.12-1. As discussed below, project impacts will be less than significant, and will be further minimized with the APMs described in Section 3.12.4.2.

TABLE 3.12-1
CEQA Checklist for Noise
Embarcadero-Potrero 230 kV Transmission Project

XII. NOISE **Would the project result in:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporation**	**Less than Significant Impact**	**No Impact**
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☑	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☑
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

3.12.1.1 Fundamentals of Noise

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below the ambient pressure. There are several ways to measure noise, depending on the source of the noise, the receiver, and the reason for the noise measurement.

The most common noise metric is the overall A-weighted sound-level measurement that has been adopted by regulatory bodies worldwide. The A-weighting network utilizes frequency-dependent factors to produce a measurement which defines sound in a similar fashion to how a person perceives or hears it, thus achieving a strong correlation in terms of how to evaluate acceptable and unacceptable sound levels. Table 3.12-2 presents the relative A-weighted noise levels of common sounds measured in the environment and industry for various qualitative sound levels.

TABLE 3.12-2
Typical Sound Levels Measured in the Environment and Industry
Embarcadero-Potrero 230 kV Transmission Project

Noise Source at a Given Distance	Sound Level in A-weighted Decibels (dBA)	Qualitative Description
Carrier deck jet operation	140	
	130	Pain threshold
Jet takeoff (200 feet)	120	
Auto horn (3 feet)	110	Maximum vocal effort
Jet takeoff (1,000 feet) Shout (0.5 foot)	100	
New York subway station Heavy truck (50 feet)	90	Very annoying; Hearing damage (8-hour, continuous exposure)
Pneumatic drill (50 feet)	80	Annoying
Freight train (50 feet) Freeway traffic (50 feet)	70 to 80 70	Intrusive (telephone use difficult)
Air conditioning unit (20 feet)	60	
Light auto traffic (50 feet)	50	Quiet
Living room Bedroom	40	
Library Soft whisper (5 feet)	30	Very quiet
Broadcasting/Recording studio	20	
	10	Just audible

Source:
Adapted from Table E, "Assessing and Mitigating Noise Impacts" (New York Department of Environmental Conservation, 2001).

A-weighted sound levels may be measured or presented as the equivalent sound pressure level (L_{eq}), which is defined as the average equivalent noise level required to produce the same total energy on an equal energy basis for a stated period of time. Statistical methods are used to define the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by percentile exceeded sound level L_{xx}, where xx represents the percentile of time the sound level is exceeded. Therefore, L_{90} represents the noise level that is exceeded during 90 percent of the measurement period. Similarly, L_{10} represents the noise level exceeded for 10 percent of the measurement period.

The general human response to changes in noise levels that are similar in frequency content (such as comparing increases in continuous (L_{eq}) traffic noise levels) are summarized as follows:

- A 3-decibel change in sound level is considered a barely noticeable difference.
- A 5-decibel change in sound level will typically be noticeable.
- A 10-decibel increase is considered to be a doubling in loudness.

3.12.2 Regulatory Background and Methodology

3.12.2.1 Regulatory Background

Federal or Federal Delegated

There are no federal regulations that limit overall environmental noise levels for this project.

State or State Delegated

Although there is no statewide noise regulation or specific threshold for determining what constitutes a substantial increase in noise, the CEQA Checklist identifies the criteria that must be considered when analyzing a project's potential to result in temporary and permanent impacts on sensitive receptors as a result of noise (see Table 3.12-1).

Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary noise requirements. The following analysis of local regulations relating to noise is provided for information purposes and to assist with CEQA review.

The City of San Francisco's Police Code, Article 29, establishes the regulatory framework for addressing operational and construction related noise and was amended in June 2012. Operational noise limits are established based on limiting the increase over existing ambient levels. Noise sources located on commercial and industrial properties are allowed up to an 8 dBA increase over the existing local ambient as measured outside the property plane. Construction noise limits between the hours of 7:00 a.m. to 8:00 p.m. are established based on limiting noise from individual powered construction equipment sound levels to 80 dBA when measured at 100 feet. Additional limitations are imposed on impact equipment (including pavement breakers and jackhammers) which requires intake and exhaust silencers in addition to acoustical attenuation shields or shrouds. Nighttime construction noise (8:00 p.m. to 7:00 a.m.) is limited to 5 dBA above the existing local ambient at the property plane; however, the Director of Public Works or Building Inspection may grant a special permit which can consider among other items, if the proposed night work is in the general public interest. Relevant operational and construction noise regulations from Article 29 are copied below for completeness.

Section 2909 of Article 29: Regulation of Noise in the San Francisco City Ordinance Code (City of San Francisco, 2012) establishes operational noise limits as follows:

(a) Commercial and Industrial Property Noise Limits. No person shall produce or allow to be produced by any machine or device, music or entertainment or any combination of same, on commercial or industrial property over which the person has ownership or control, a noise level more than 8 dBA above the local ambient at any point outside of the property plane.

(b) Public Property Noise Limits. No person shall produce or allow to be produced by any machine or service, or combination of same, on public property, a noise level more than 10 dBA above the local ambient at a distance of 25 feet or more, unless the machine or device is being operated to serve or maintain the property.

(c) Fixed Residential Interior Noise Limits. In order to prevent sleep disturbance, protect public health and prevent the acoustical environment from progressive deterioration due to the increasing use and influence of mechanical equipment, no fixed noise source may cause the noise level measured inside any sleeping or living room in any dwelling unit located on residential property to exceed 45 dBA between the hours of 10:00 p.m. to 7:00 a.m. or 55 dBA between the hours of 7:00 a.m. to 10:00 p.m. with windows open except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

Section 2907 of Article 29: Construction Equipment in the San Francisco City Ordinance Code (City of San Francisco, 2012) defines regulations pertaining to daytime construction equipment noise:

(a) Except as provided for in Subsections (b), (c), and (d) hereof, it shall be unlawful for any person to operate any powered construction equipment if the operation of such equipment emits noise at a level in excess of 80 dBA when measured at a distance of 100 feet from such equipment, or an equivalent sound level at some other convenient distance.

(b) The provisions of Subsections (a) of this Section shall not be applicable to impact tools and equipment, provided that such impact tool and equipment shall have intake and exhaust mufflers recommended by

the manufacturers thereof and approved by the Director of Public Works or the Director of Building Inspection as best accomplishing maximum noise attenuation, and that pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof and approved by the Director of Public Works or the Director of Building Inspection as best accomplishing maximum noise attenuation.

(c) The provisions of Subsection (a) of this Section shall not be applicable to construction equipment used in connection with emergency work.

(d) Helicopters shall not be used for construction purposes for more than two hours in any single day or more than four hours in any single week.

Section 2908 of Article 29: Construction Work at Night in the San Francisco City Ordinance Code (City of San Francisco, 2012) defines regulations pertaining to construction work during the evening and nighttime hours:

(a) It shall be unlawful for any person, between the hours of 8:00 p.m. of any day and 7:00 a.m. of the following day to erect, construct, demolish, excavate for, alter or repair any building or structure if the noise level created thereby is in excess of the ambient noise level by 5 dBA at the nearest property plane, unless a special permit has been applied for and granted by the Director of Public Works or the Director of Building Inspection. In granting such special permit the Director of Public Works or the Director of Building Inspection shall consider: if construction noise in the vicinity of the proposed work site would be less objectionable at night than during daytime because of different population levels or different neighboring activities; if obstruction and interference with traffic, particularly on streets of major importance, would be less objectionable at night than during daytime; if the kind of work to be performed emits noise at such a low level as to not cause significant disturbance in the vicinity of the work site; if the neighborhood of the proposed work site is primarily residential in character wherein sleep could be disturbed; if great economic hardship would occur if the work were spread over a longer time; if the work will abate or prevent hazard to life or property; and if the proposed night work is in the general public interest. The Director of Public Works or the Director of Building Inspection shall prescribe such conditions, working times, types of construction equipment to be used, and permissible noise emissions, as required in the public interest.

3.12.2.2 Methodology

Evaluation of potential noise impacts from the project included reviewing relevant county, community, and city noise standards, characterizing the existing noise environment, and predicting noise levels and related impacts during both construction and operations.

Equipment used in the construction of the proposed project will generate noise. Typical noise levels generated by construction equipment have been previously calculated and published in various reference documents. The most recent and complete compilation of construction equipment noise is the Roadway Construction Noise Model prepared by the Federal Highway Administration (FHWA). The expected equipment noise levels listed in the Roadway Construction Noise Model User's Guide (FHWA, 2006) were used for this evaluation.

There are three potential sources of operational noise associated with the electric power lines and substations in this project: corona noise from the transmission lines; transformer and shunt reactor noise from Potrero Switchyard; and vehicle noise from maintenance vehicles (infrequent). The infrequent noise from maintenance vehicles will not substantially change from the existing maintenance-related noise. Transformer and shunt reactor noise decays with distance. Equipment specifications and construction details can be incorporated into the design to assure applicable sound levels are complied with. Corona noise, as discussed below, is generally not an issue for aboveground 230 kV power lines, and furthermore this line will be underground. Thus, none of these sources will result in substantial noise generation from the proposed project.

Corona generates audible noise during operation of aboveground high-voltage transmission lines. The noise is generally characterized as a crackling, hissing, or humming noise. During wet or foul weather conditions (such as rain or fog), the conductor will produce the greatest amount of corona noise and have the greatest potential to be

noticeable. However, during heavy rain the ambient noise generated by the falling raindrops will typically be greater than the noise generated by corona. This noise is caused by small electrical discharges from the water drops and is generally more noticeable on high-voltage lines. Corona is usually not a design issue for power lines rated at 230 kV and lower. Audible noise from buried lines is not anticipated.

Another aspect of the project that may generate noise is the marine cable installation. The transmission cables will primarily be installed underwater and offshore. Cables are expected to be installed by using a jet plow or other similar cable burying technique. The water jet consists of a long blade mounted to either a sled- or tire-mounted submerged vehicle that is pulled along the seabed behind a barge. The blade contains hundreds of water nozzles on the leading edge that fluidize the seabed materials using high pressure water. The submarine cable is fed from the surface vessel down to the seabed through the blade and exits at the foot of the blade to be placed directly into the Bay bottom sediments. The length and angle of the blade determines the burial depth of the cable. As the blade moves forward and the cable is placed in the momentarily-opened trench, the majority of the fluidized sediments behind the blade fall back into the trench, effectively burying the cable. This cable laying method has considerably less environmental disturbance than traditional mechanical trenching methods. As the majority of noise-generating activities will occur underwater, this construction activity is not expected to create substantial increases to ambient noise levels onshore. Barges and tugs are expected to be similar in sound level to diesel powered construction equipment.

Horizontal Directional Drilling (HDD) is a process that allows for trenchless construction across an area by drilling a hole well below the depth of a conventional line and pulling the line through the predrilled borehole. HDD will be used at two locations, the Potrero HDD Transition Area (refer to Figure 2-11 in Section 2.4.2.1 and the Embarcadero HDD Transition Area (refer to Figure 2-12) to avoid direct impacts to sensitive areas and/or to avoid areas with difficult constructability issues. Once the pilot hole is completed it may be enlarged, using reaming tools, to accept the proposed lines. The reaming tools are generally attached to the drill string at the exit point of the pilot hole and then rotated and drawn back to the drilling rig, thus progressively enlarging the pilot hole with each pass. During this process, drilling fluid typically consisting of bentonite clay and water will be continuously pumped into the hole to remove cuttings and maintain the integrity of the hole. Once the hole has been sufficiently enlarged, the line will be attached behind the reaming tool on the exit side of the crossing and pulled back through the drill hole toward the drill rig, completing the crossing. If soil conditions are such that the integrity of the hole cannot be readily maintained with daytime only activities, HDD operations will have to proceed on a 24-hour basis. HDD utilizes engine driven equipment whose sound levels are discussed in the following sections.

No pile driving is anticipated for this project, and therefore no substantial hydro-acoustic vibrations would be generated.

3.12.3 Existing Setting

The project is located in the City of San Francisco. The project will be primarily located underwater along the bottom of western San Francisco Bay in near-shore areas, with underground lines ending at Potrero Switchyard and Embarcadero Substation. Land use is primarily industrial by Potrero Switchyard and residential and commercial near Embarcadero Substation.

As noted above, noise-sensitive land uses generally are defined as locations where people reside or where the presence of unwanted sound could adversely affect the designated use of the land. Typically, noise-sensitive land uses include residences, hospitals, places of worship, libraries, and schools, as well as nature and wildlife preserves and parks.

Figures 3.12-1 and 3.12-2 depict the locations of the sensitive receptors in relation to the project site. As shown in Figure 3.12-2, the Potrero Switchyard site is located at least 700 feet from the nearest residence in an industrial neighborhood. In the Embarcadero portion of the project area, pending final location of HDD which will be determined during final design, loft residences are located between 100 to 250 feet away from HDD activities. As indicated in Figure 3.12-1, PG&E monitored sound levels in the vicinity of the Embarcadero portion of the project

FIGURE 3.12-1

Land Uses in Vicinity of Embarcadero Portion of Project

Embarcadero-Potrero 230 kV Transmission Project

San Francisco, CA

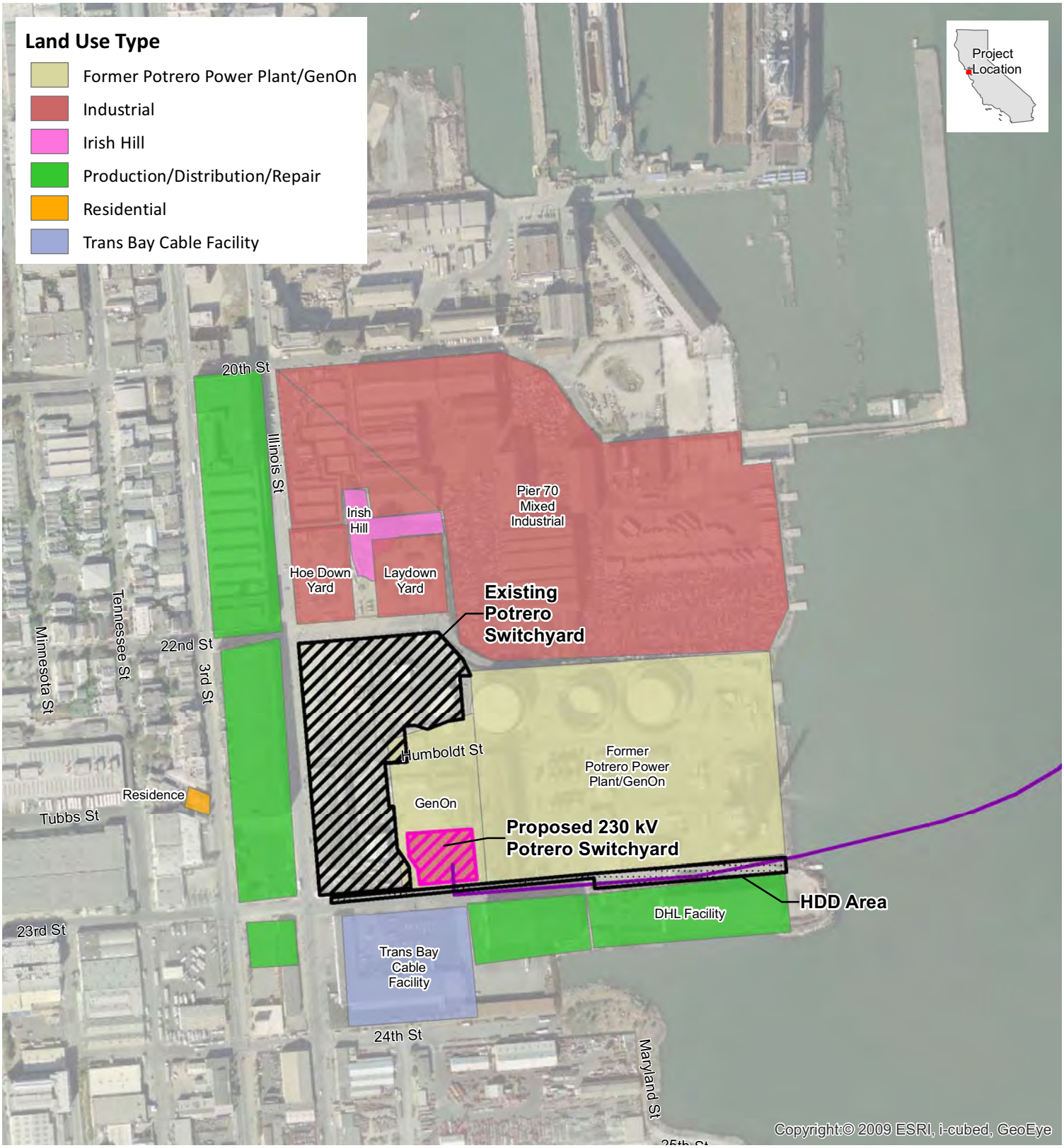


FIGURE 3.12-2

Land Uses in Vicinity of Potrero Portion of Project

Embarcadero-Potrero 230 kV Transmission Project

San Francisco, CA

near the proposed HDD activity. These measurements were collected by PG&E using a Larson Davis 820 ANSI S1.4 Type 1 (precision) sound level meter over a period of two nights. The measurements were conducted between July 31, 2012 and August 2, 2012 and are summarized in Table 3.12-3.

TABLE 3.12-3
Summary of Measured Sound Levels (dBA)
Embarcadero-Potrero 230 kV Transmission Project

Date	Time	L_{eq}	L_{10}	L_{50}	L_{90}
31-Jul	7:00 PM	69	70	66	64
31-Jul	8:00 PM	68	70	68	66
31-Jul	9:00 PM	68	69	68	66
31-Jul	10:00 PM	68	70	68	66
31-Jul	11:00 PM	67	70	67	64
1-Aug	12:00 AM	66	69	65	62
1-Aug	1:00 AM	65	67	63	58
1-Aug	2:00 AM	63	66	62	56
1-Aug	3:00 AM	62	65	61	55
1-Aug	4:00 AM	64	67	62	57
1-Aug	5:00 AM	66	69	66	61
1-Aug	6:00 AM	69	71	69	66
1-Aug	7:00 AM	70	72	70	68
1-Aug	8:00 AM	68	70	67	64
1-Aug	9:00 AM	69	71	68	66
1-Aug	10:00 AM	69	71	69	67
1-Aug	11:00 AM	68	70	68	66
1-Aug	12:00 PM	68	70	68	65
1-Aug	1:00 PM	67	69	66	63
1-Aug	2:00 PM	68	70	67	64
1-Aug	3:00 PM	69	72	67	65
1-Aug	4:00 PM	68	71	66	64
1-Aug	5:00 PM	70	73	68	65
1-Aug	6:00 PM	70	73	67	64
1-Aug	7:00 PM	67	69	65	62
1-Aug	8:00 PM	68	69	67	65
1-Aug	9:00 PM	68	69	67	66
1-Aug	10:00 PM	64	67	62	57
1-Aug	11:00 PM	66	68	66	63
2-Aug	12:00 AM	66	68	65	62

TABLE 3.12-3
Summary of Measured Sound Levels (dBA)
Embarcadero-Potrero 230 kV Transmission Project

Date	Time	L_{eq}	L_{10}	L_{50}	L_{90}
2-Aug	1:00 AM	66	67	63	59
2-Aug	2:00 AM	63	65	62	57
2-Aug	3:00 AM	62	65	60	55
2-Aug	4:00 AM	64	67	62	57
2-Aug	5:00 AM	66	69	66	62
2-Aug	6:00 AM	69	71	69	66
2-Aug	7:00 AM	69	71	69	65
2-Aug	8:00 AM	68	71	68	65
2-Aug	9:00 AM	69	71	69	67
2-Aug	10:00 AM	69	71	68	66
2-Aug	11:00 AM	68	70	68	66
2-Aug	12:00 PM	69	70	67	63

Notes:
dBA = A-weighted decibels; L_{eq} = equivalent sound pressure level. See Section 3.12.1.1 for explanation of percentile exceeded sound level L_{xx} (L_{10}, L_{50}, L_{90}), where xx represents the percentile of time the sound level is exceeded.

3.12.4 Applicant-Proposed Measures and Potential Impacts

3.12.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, the potential significance of project noise impacts must be evaluated for each of the criteria shown in Table 3.12-1. In accordance with Appendix G of the CEQA Guidelines, noise impacts may be considered significant if the project results in exposure of persons to noise levels exceeding applicable standards or to excessive groundborne vibration or noise; substantial permanent temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or for areas within an airport plan or in proximity to an airstrip, exposure of people residing or working in the project area to excessive noise levels.

3.12.4.2 Applicant-Proposed Measures

As part of constructing the project, the following noise-abatement measures will be implemented and will be considered during evaluation of the potential noise impacts:

APM Noise (NO)-1: Noise Minimization with Portable Barriers. Compressors and other small stationary equipment used during construction will be shielded with portable barriers if located within 200 feet of a residence.

APM NO-2: Noise Minimization with Quiet Equipment. Quiet equipment (for example, equipment that incorporates noise-control elements into the design; e.g., quiet model compressors can be specified) will be used during construction whenever possible.

APM NO-3: Noise Minimization through Direction of Exhaust. Equipment exhaust stacks and vents will be directed away from buildings where feasible.

APM NO-4: Noise Minimization through Truck Traffic Routing. Truck traffic will be routed away from noise-sensitive areas where feasible.

APM NO-5: Noise Disruption Minimization through Residential Notification. In the event that nighttime construction is necessary because of clearance restrictions, affected residents will be notified in advance by mail, personal visit, or door-hanger and informed of the expected work schedule.

APM NO-6: HDD Noise Minimization Measures. Temporary barriers utilizing materials such as intermodal containers or frac tanks, plywood walls, mass-loaded vinyl (vinyl impregnated with metal) or hay bales will be used to reduce noise generated by the onshore HDD operations. If night-time HDD activities are required, the project will monitor actual noise levels from HDD activities between 8:00 p.m. and 7:00 a.m. If the noise levels created by the HDD operation are found to be in excess of the ambient noise level by 5 dBA at the nearest property plane, PG&E will, within 24 hours of the excess measurement, employ additional minimization measures necessary to limit the increase to 5 dBA. Such measures may include ensuring semi-permanent stationary equipment (generators, lights, etc) are stationed as far from sensitive areas as practicable, utilize "quiet" or "Hollywood/Movie Studio" silencing packages, modify barriers to further reduce noise levels.

APM NO-7: Noise Minimization Equipment Specification. PG&E will specify general construction noise reduction measures that require the contractor to ensure all equipment is in good working order, adequately muffled and maintained in accordance with the manufacturers' recommendations.

3.12.4.3 Impacts

Construction Noise Levels

Typical noise levels generated by the construction equipment listed in the project description have been calculated previously and published in various reference documents. The expected equipment noise levels listed in the *FHWA Roadway Construction Noise Model User's Guide* (FHWA, 2006) were used for this evaluation. The User's Guide provides the most recent comprehensive assessment of noise levels from construction equipment. Table 3.12-4 summarizes the average (L_{eq}) A-weighted noise level at several distances. Table 3.12-4 provides typical range and usage factors for general construction equipment and activities consistent with the FHWA Roadway Construction Noise Model. The acoustical usage factor does not equate to the percentage of time the equipment is in use, but rather the percentage of time that it is operated at its maximum sound emission level. For example, a back hoe may be used and energized during the entire shift, but on average it is expected to operate at its maximum sound level 40 percent of the time.

Review of the typical construction equipment noise levels in Table 3.12-4 indicates that the loudest equipment generally emits noise in the range of 80 to 90 dBA at 50 feet, with usage factors of 40 percent to 50 percent. Noise at any specific receptor is dominated by the closest and loudest equipment. The types and numbers of construction equipment near any specific receptor location will vary over time. The following conservative assumptions were used for modeling construction noise:

- One piece of equipment generating a reference noise level of 85 dBA (at 50 feet distance with a 40 percent usage factor) located on the transmission line route.
- Two pieces of equipment generating reference 85-dBA noise levels located 50 feet farther away on the transmission line route (100 feet distance with a 40 percent usage factor).
- Two additional pieces of equipment generating reference 85-dBA noise levels located 100 feet farther away on the transmission line route (200 feet distance with a 40 percent usage factor).
- Table 3.12-5 presents construction equipment noise levels at various distances based on this scenario. This scenario is anticipated to be representative of both on-shore and off-shore activities and is likely conservative given the reductions afforded by intervening buildings or terrain that have not been considered.

Although current plans are to perform most HDD activities during daytime hours, if soil conditions are such that integrity of the hole cannot be readily maintained with daytime only activities, HDD operations will have to proceed on a 24-hour basis.

TABLE 3.12-4
Typical Construction Equipment Noise Levels
Embarcadero-Potrero 230 kV Transmission Project

Equipment Description	Acoustical Usage Factor (%)	Specified L_{max} at 50 feet (dBA)	Calculated L_{eq} at 100 feet (dBA)	Calculated L_{eq} at 1,000 feet (dBA)	Calculated L_{eq} at 2,000 feet (dBA)	Calculated L_{eq} at 4,000 feet (dBA)
All Other Equipment > 5 horsepower	50	85	76	56	50	44
Auger Drill Rig	20	85	72	52	46	40
Backhoe	40	80	70	50	44	38
Crane	16	85	71	51	45	39
Dump Truck	40	84	74	54	48	42
Grader	40	85	75	55	49	43
Pickup Truck	40	55	45	25	19	13
Tractor	40	84	74	54	48	42

Notes:
dBA = A-weighted decibels; L_{eq} = equivalent sound pressure level
Source*: FHWA Roadway Construction Noise Model User's Guide* (FHWA, 2006).
Equation to calculate L_{max} at 1,000, 2,000 and 4,000 feet is as follows:

$$L_{eq}(h) = L_{max} + 10*\log(A.U.F.) - 20*\log(D/Do)$$

where:

L_{max} = Maximum noise emission level of equipment based on work cycle at D/Do (decibel).
A.U.F. = Acoustical usage factor, which accounts for the percent time that equipment is in use over the time period of interest (1 hour).
D = Distance from the equipment to the receptor (feet).
Do = Reference distance (generally, 50 feet) at which the L_{max} was measured for the equipment of interest (feet).

TABLE 3.12-5
Construction Equipment Noise Levels Versus Distance
Embarcadero-Potrero 230 kV Transmission Project

Distance from Construction Activity (feet)	L_{eq} Noise Level (dBA)
50	83
100	79
200	74
400	69
800	63
1,600	58
3,200	52
6,400	46

Notes:
dBA = A-weighted decibels; L_{eq} = equivalent sound pressure level
See text narrative preceding this table for the parameters of this noise modeling scenario.

Anticipated HDD equipment at the entry location includes:

- DD-330 American Augers trailer mounted drill rig or equivalent
- Mud rig
- Mud pump
- Two centrifugal pumps
- Excavator
- All engines are anticipated to have hospital grade exhaust mufflers.

The estimated sound pressure level from the operation of equipment operating at the entry is approximately 83 dBA at a distance of 100 feet. These estimates are based on conservative estimates of the horsepower for the various engines and may overestimate the actual noise levels. Table 3.12-6 summarizes the predicted noise levels during HDD activities assuming a minimal barrier effectiveness of 5 dBA. Barrier effectiveness of 5dBA is a conservative assumption, given that the use of barriers can routinely reduce noise by up to 20 dBA. Geometric divergence is the primary mechanism of noise reduction close to a noise source. At greater distances, additional reductions (for example, ground effects and atmospheric attenuation) can be significant. Atmospheric attenuation is approximately 1.5 dBA per 1000 feet. This excess attenuation is not accounted for in the model nor is the potential shielding afforded by intervening structures. Therefore, the model output should be considered conservatively high.

TABLE 3.12-6
HDD Equipment Noise Levels Versus Distance upon Implementation of Noise Reduction Measures
Embarcadero-Potrero 230 kV Transmission Project

Distance from HDD Entry Point (feet)	L_{eq} Noise Level (dBA)
100	78
200	72
400	66
600	63
800	60
1,000	58
1,500	55
2,000	52
4,000	46

Notes:
dBA = A-weighted decibels; L_{eq} = equivalent sound pressure level
See text narrative preceding this table for the parameters of this noise modeling scenario.

APM NO-6, described above, should reasonably achieve a minimum 5 dBA reduction, which is incorporated into Table 3.12-6. Noise walls affect sound propagation by interrupting its propagation and creating an "acoustic shadow zone." The sound pressure level is lower in the shadow zone than in the respective unobstructed free field. Effectiveness of barriers depends on two primary design features:

1. The barrier must be high enough to break the line-of-sight between the observer and source and long enough to prevent noise leaks around the ends.

2. Noise should not be transmitted through the barrier.

The effectiveness of a noise barrier is quantified by its field insertion loss (I.L.). Field insertion loss is simply the difference in the noise levels at the same location before and after the barrier is constructed. The barrier should be tall enough to block the line-of-sight to the noise generating portion of project area; for most diesel-powered equipment, the wall would have to be tall enough to block the line-of-sight to the exhaust. A well-constructed barrier wall constructed of ¾" plywood that minimizes the open space (air gaps between plywood panels) may achieve a 5 to 10 dBA reduction, while a practical limit of barrier effectiveness is typically 20 dBA.

As APM NO-6 notes, current plans anticipate performing most HDD activities during daytime hours, as well as monitoring noise levels during any required nighttime HDD activities. This data will be used to update the analysis to reflect actual HDD noise emissions from project specific equipment. Given the conservative nature of the present analysis, it is expected that measured noise levels will be less than or similar to those predicted in Table 3.12-6.

Impact Analysis

a) Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? ***Less than significant impact*****.**

Construction

Noisy construction activities will be short-term, temporary, and limited to daytime hours to the extent practicable. PG&E will consult with the City and County of San Francisco regarding opportunities to reduce noise impacts and will obtain and comply with all necessary ministerial permits. As indicated in Section 3.12.4.3, typical construction activities are predicted to comply with the City's requirements of 80 dBA at 100 feet. The overall construction period is expected to last a total of approximately 16 months, with work occurring five days per week, during daytime hours, progressing from one area to another along the route. The expected duration of the HDD activities is typically 13 days per drill, with each of the three phases drilled separately for a total of 39 days for each transition area. Work weeks and days might include 6 days per week and 10 hours per day, extending over a period of about 6 to 7 weeks.

If nighttime construction is necessary to continue work until a safe stopping point is reached or if planned electrical outages (clearances) are scheduled at night, activities will be infrequent and short-term. Construction of the project will result in a less-than-significant impact under this criterion. The implementation of APMs NO-1 through NO-7 will further minimize exposure to less-than-significant construction noise.

Operation

Corona noise associated with the new electrical wires is not anticipated to be audible given that the line will be buried. No increases in noise from the existing Embarcadero Substation is expected from the proposed modifications, since these will be within the enclosed building and no new HVAC equipment would be installed as part of this project. PG&E's design criteria for the new outdoor transformer and shunt reactor at the proposed Potrero Switchyard are anticipated to result in a combined maximum sound level of 53 dBA at a distance of 400 feet, without accounting for additional reductions afforded by intervening structures. The new equipment is not expected to result in an increase which exceeds existing levels by more than 8 dBA. Noise from the new switchyard will be minimized by enclosure of the facilities within a building. In addition, these areas are located in an area of industrial and commercial uses, and would not affect residential uses, which are more than 500 feet from the new switchyard. Therefore, the impacts from operation noise from the proposed project will result in a less-than-significant impact under this criterion.

Maintenance activities currently performed at Potrero Switchyard and Embarcadero Substation will continue. Maintenance activities will typically occur over short timeframes and generate minimal noise. As with existing maintenance activities involving noise-generating equipment or vehicles, noise reduction measures will be employed to reduce temporary noise impacts as described in APMs above. Therefore, the impacts from maintenance noise due to implementation of the proposed project will remain less than significant under this criterion.

b) Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? ***Less than significant impact.***

Construction

Construction activities (e.g., ground-disturbing activities, including grading and movement of heavy construction equipment) may generate localized groundborne vibration and noise. Impact pile driving is not proposed and heavy equipment operation is not anticipated to result in excessive groundborne vibration. Earthmoving equipment which may result in groundborne vibration or noise will occur during daytime hours and will be of short-term duration. Therefore, construction of the proposed project will result in a less-than-significant impact under this criterion.

Operation

Equipment associated with normal operation and maintenance of the proposed project will not produce any groundborne noise or vibration; therefore, operation and maintenance of the project will result in no impact under this criterion.

c) Would the project result in substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? ***No impact.***

Construction

Project construction will be temporary and therefore will not result in a substantial permanent increase in ambient noise levels.

Operation

Corona is typically not a design concern for transmission lines at 230 kV and lower, and the proposed line will be underground, eliminating any potential audible noise. No noticeable increases in noise from the existing substation or switchyard are expected from the proposed modifications to the buswork. The proposed additional transformer and shunt reactor capacity will be specified and designed to comply with the applicable noise requirements. Therefore, there will be no impact from operation noise from the proposed project under this criterion. Maintenance activities will be temporary and are addressed under the next criterion.

d) Would the project result in substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? ***Less-than-significant impact.***

Construction

Any increases in ambient noise levels in the project vicinity during construction will be temporary, short-term, and intermittent. As indicated in Section 3.12.4.3, typical construction activities are predicted to comply with the City's requirements of 80 dBA at 100 feet. Construction noise impacts from the proposed project will be a less-than-significant impact under this criterion. Implementation of APMs NO-1 through APM NO-5 and APM NO-7 will further minimize general construction equipment noise. Minimally attenuated HDD activities are predicted to yield sound levels of 72 to 78 dBA at the closest residences to the Embarcadero HDD location, and between 60 and 63 dBA in the Potrero area.

As discussed earlier, the 5dBA noise reduction level is a conservative number. APM NO-6 could result in up to a 20 dBA reduction in noise levels, given that the noise attenuation measures that would be implemented for the project can generally achieve that degree of noise reduction.

Current plans anticipate the majority of HDD activities to take place during daytime hours; however, some overnight activity may be required. Consistent with APM NO-6, noise levels will be monitored during any nighttime HDD activities to allow necessary adjustments and further measures, as described in APM NO-6, to be put into place as necessary. APM NO-6 will minimize the potential adverse impacts to less-than-significant.

Operation

Maintenance activities currently performed at Potrero Switchyard and Embarcadero Substation will continue. Maintenance activities will typically occur over short timeframes each year, as they are now, and generate minimal noise. Therefore, the impacts from operation and maintenance noise due to implementation of the proposed project will continue to be less than significant under this criterion.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? ***No impact.***

Construction, operation, and maintenance of the project will occur at a distance greater than 2 miles from a public airport; therefore, the project will result in no impact under this criterion.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? ***No impact.***

No private airstrips are located within 2 miles of the project; therefore, the project will result in no impact under this criterion.

3.12.5 References

City of Pittsburg. 2006. Draft EIR for the Proposed Trans Bay Cable Project. Online: http://www.ci.pittsburg.ca.us/pittsburg/pdf/tbc/index.htm

City of San Francisco. 2012. San Francisco City Code. Online: http://www.amlegal.com/nxt/gateway.dll?f=templates&fn=default.htm&vid=amlegal:sanfrancisco_ca

Federal Highway Administration (FHWA). 2006. *FHWA Roadway Construction Noise Model User's Guide*. Final Report. U.S. Department of Transportation. FHWA-HEP-05-054. DOT-VNTSC-FHWA-05-01. Online: http://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf. January.

New York Department of Environmental Conservation. 2001. *Assessing and Mitigating Noise Impacts*. February 2001.

3.13 Population and Housing

3.13.1 Introduction

This section describes existing conditions and potential impacts on population and housing as a result of construction, operation and maintenance of the project, and concludes there will be no impacts in this area. The proposed project's potential effects were evaluated to determine their level of significance as provided under the CEQA Guidelines. The significance criteria, as set forth in CEQA Guidelines Appendix G, are summarized in Table 3.13-1. As discussed in more detail below, because the project will not induce substantial population growth or displace existing housing or numbers of people, no mitigation is required and no applicant-proposed measures are necessary.

TABLE 3.13-1
CEQA Checklist for Population and Housing
Embarcadero-Potrero 230 kV Transmission Project

XIII. POPULATION AND HOUSING **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less-than-Significant Impact**	**No Impact**
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

3.13.2 Regulatory Background and Methodology

3.13.2.1 Regulatory Background

There is no regulatory background information relevant to addressing project impacts to population and housing.

3.13.2.2 Methodology

To evaluate potential effects on population and housing resources, the San Francisco General Plan Housing Element (San Francisco Planning Department, 2011) and U.S. Census Bureau (2012) data were reviewed. In addition, a windshield survey was conducted of the proposed route, substation, and switchyard sites.

3.13.3 Existing Setting

Regional

The project is located in the City and County of San Francisco. In 2010, the San Francisco Bay Area had a regional population of approximately 7,150,739 people (Metropolitan Transportation Commission [MTC] and Association of Bay Area Governments [ABAG], 2012).

Local

San Francisco has an estimated land area of 46.87 square miles. As of 2010, the City of San Francisco had a population of approximately 805,235 people and approximately 376,942 housing units with a vacancy rate of 8.3 percent (U.S. Census Bureau, 2010). ABAG projects that San Francisco's population will rise to 867,100 by the year 2020, creating the need to house an additional 61,865 people by 2020 (San Francisco Planning Department, 2011).

The project is located in the South of Market district as defined by the Housing Element of the San Francisco General Plan. Between 2000 and 2008, South of Market accounted for about 43 percent of the new housing development in the city, due mostly to construction of larger structures with more than ten units. New units have also been developed in this district by conversion of warehouses to living or live/work spaces (San Francisco Planning Department, 2011). San Francisco has more than 30,000 hotel rooms and experienced an average vacancy rate of 21 percent in 2011 (San Francisco Center for Economic Development, 2012).

3.13.4 Applicant-Proposed Measures and Potential Impacts

3.13.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, and as summarized in Table 3.13-1, impacts to population and housing may be considered significant if the Project would:

- Induce substantial population growth
- Displace substantial numbers of existing housing
- Displace substantial numbers of people

3.13.4.2 Applicant-Proposed Measures

No applicant-proposed measures are proposed for population and housing because project construction, operation, and maintenance will have no impact on these resources.

3.13.4.3 Impacts

a) Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? *No Impact.*

The project will improve reliability of electric service for a large section of San Francisco served by Embarcadero Substation. The project will not extend new power lines or other infrastructure into areas not already served; and the project does not facilitate growth that has not already been accounted for in long-range planning documents. While the project will improve electric transmission reliability by connecting Embarcadero Substation to a second source of power (via the Trans Bay Cable), power availability and reliability in a fully urbanized area are not constraints to population growth in San Francisco. New development will not be generated by the project.

During peak construction times, PG&E will employ approximately 75 workers (including switchyard workers, supervisors, and inspectors). Approximately 20 percent of this workforce will be locally sourced. There are adequate hotel and motel accommodations within San Francisco to provide accommodations to the 60 workers that may temporarily relocate to the area during construction. PG&E will operate the new switchyard and transmission line using existing operation and maintenance staff. No impact to population growth would occur. Thus, the project would not directly or indirectly induce substantial population growth.

b) Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? *No Impact.*

Construction activities for the transmission cable will primarily occur in the Bay, within existing streets, and other developed areas. Construction at Embarcadero Substation will be contained inside the building. Construction activities for Potrero Switchyard will occur in an industrial area. Public safety systems (signing, fencing, etc.) will be employed to protect the public. Offsite storage at existing PG&E or other existing industrial facilities will also occur. Construction is expected to last for approximately 16 months. No housing will be displaced during project construction or operation; therefore no impact will occur.

c) Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? *No Impact.*

Construction will occur in the streets, the Bay, and on industrial parcels and would not displace any housing or people; therefore, no impact will occur.

3.13.5 References

Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG). 2012. "Bay Area Census" website—San Francisco Bay Area page. Source: Census 2000 SF1, SF3, DP1-DP4, Census 2010 DP-1. Online: http://www.bayareacensus.ca.gov/bayarea.htm. Accessed May 31.

San Francisco Center for Economic Development. 2012. "QuickFacts" April 2012 online newsletter. Online: http://www.sfchamber.com/sfced/newsletter/2012.04/sfced_newsletter_April12.html. Accessed May 18, 2012.

San Francisco Planning Department. 2011. *San Francisco General Plan, Housing Element.* March.

U.S. Census Bureau. 2012. "State and County QuickFacts" Website, San Francisco City and County. Online: http://quickfacts.census.gov/qfd/states/06/06075.html. Website last updated January 31, 2012. Accessed May 18, 2012.

3.14 Public Services

3.14.1 Introduction

This section describes existing conditions and potential impacts on public services as a result of construction, operation, and maintenance of the project, and concludes there will be no impacts in these areas. Public services include fire and emergency protection, police protection, and maintenance of public facilities such as schools and parks. Emergency access is discussed in Section 3.16, Transportation and Traffic. Temporary construction impacts on schools and parks, such as dust and noise, are discussed in Sections 3.3, Air Quality, and 3.12, Noise. Compatibility with future park planning efforts is discussed in Section 3.10, Land Use and Planning. Potential impact to parks and recreational facilities are discussed in Section 3.15, Recreation.

The proposed project's potential effects on public services were evaluated to determine their level of significance as provided under the CEQA Guidelines. The significance criteria, as set forth in CEQA Guidelines Appendix G, are summarized in Table 3.14-1. As discussed in more detail below, because there will be no project-related impacts to public services, no Applicant-Proposed Measures are proposed and no mitigation is required.

TABLE 3.14-1
CEQA Checklist for Public Services
Embarcadero-Potrero 230 kV Transmission Project

XIV. PUBLIC SERVICES Would the project:	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less-than-Significant Impact**	**No Impact**
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☑
Police protection?	☐	☐	☐	☑
Schools?	☐	☐	☐	☑
Parks?	☐	☐	☐	☑
Other public facilities?	☐	☐	☐	☑

3.14.2 Regulatory Background and Methodology

3.14.2.1 Regulatory Background

There is no regulatory background information for public services that is relevant to the project because electric transmission projects do not affect service ratios, response times, or other performance objectives.

3.14.2.2 Methodology

In preparing this section, reviews were conducted of the San Francisco General Plan, Community Facilities Element (San Francisco Planning Department, 2012); websites for the San Francisco Fire Department (SFFD, 2012a), San Francisco Police Department (SF Police Department, 2012a), San Francisco Unified School District (SFUSD, 2012), ParkScan San Francisco (2012), San Francisco Recreation and Park Department (2012), and U.S. Coast Guard (USCG, 2012); and telephone communications with the SFFD (2012b) and SF Police Department (2012b).

3.14.3 Existing Conditions

3.14.3.1 Environmental Setting

Regional

United States Coast Guard. Portions of the project are located in and adjacent to San Francisco Bay. The USCG is the lead federal agency for maritime security and law enforcement. Headquartered on Coast Guard Island in Alameda, the Eleventh District of the USCG encompasses California as well as three other states. Sector San Francisco, whose area of responsibility covers Northern California, is stationed on Yerba Buena Island. The USCG is responsible for search and rescue, homeland security, law enforcement, marine safety, and aids to navigation in San Francisco Bay. They coordinate safe and efficient transit of vessels in San Francisco Bay. USCG personnel provide support to the SFFD when necessary.

Local

Fire and Emergency Services. Emergency services are provided to the project area by the SFFD, whose services include fire suppression; tactical rescue; emergency medical care; fire prevention; arson investigation; and response to natural disasters, mass-casualties, and hazardous materials incidents. They provide protection to the public within the 49 square miles of San Francisco. Resources consist of 43 engine companies, 19 truck companies, a fleet of ambulances, 2 heavy rescue squad units, 2 fireboats, and multiple special purpose units distributed through 51 stations. The fire stations closest to the project area are shown in Table 3.14-2.

TABLE 3.14-2
Emergency Services and Law Enforcement Providers
Embarcadero-Potrero 230 kV Transmission Project

Station	Address	Route Segments	Distance
United States Coast Guard			
Sector San Francisco Bay	Yerba Buena Island	Marine	2 to 4 miles
San Francisco Fire Department			
Fire Station 35	Pier 22 1/2 , the Embarcadero at Harrison Street	Marine Fireboats Guardian and Phoenix are docked here	0.2 mile (Waterfront) to 0.3 mile (Fremont and Folsom)
Fire Station 25	3305 3rd Street at Cargo Way	Potrero Landing to Switchyard	0.65 to 0.96 mile
Fire Station 1	676 Howard Street at 3rd Street	Embarcadero Landing to Substation	0.5 to 0.92 mile
San Francisco Police Department			
Southern Station	850 Bryant Street	Embarcadero Landing to Substation	1.04 to 1.22 miles
Bayview Station	201 Williams Street	Potrero landing to switchyard	1.84 miles

Police Services. The San Francisco Police Department provides law enforcement services to the City and County of San Francisco, including the project area. There are ten district stations divided into two divisions. The stations that would serve the project area are listed in Table 3 14.2 above. The department also has a Marine Unit that patrols 64 square miles of San Francisco Bay, maintaining direct contact with the USCG and other marine operators. The Marine Unit patrols the waterfront and conducts marine recovery operations. It maintains four vessels and two personal watercraft.

Currently the San Francisco Police Department has approximately 200 officers less than the Charter-mandated minimum. The department is moving forward on a five-year hiring plan to bring the number of sworn officers up to the required minimum by 2015 (SF Police Department, 2012a).

Schools. The SFUSD has a total of 102 schools and 13 charter schools in the San Francisco. In 2011 there were 52,900 students registered in the district. Enrollment in the district declined gradually during the 2000s, and began to increase slightly in 2009. There are no public schools within half a mile of the project area.

Parks. The San Francisco Recreation and Park Department builds, maintains, and renovates parks and recreation facilities in San Francisco. Existing parks in the vicinity of the project are also operated by the San Francisco Port Authority and the San Francisco Municipal Transit Authority. Table 3.15-2 in Section 3.15, Recreation, lists existing parks within half a mile of the project area. There are no parks adjacent to the project site.

3.14.4 Applicant-Proposed Measures and Potential Impacts

3.14.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, impacts to public services may be considered significant if the project were to result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:

- Fire protection
- Police protection
- Schools
- Parks
- Other public facilities

3.14.4.2 Applicant-Proposed Measures

No applicant-proposed measures are suggested for public services because project construction, operation and maintenance will have no impact on these public services.

3.14.4.3 Impacts

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services: fire protection, police protection, schools, parks, other public facilities? ***No impact.***

Fire Protection and Police Protection

The SF Police Department and SFFD have indicated that they will be able to serve the project during construction, operation, and maintenance (SF Police Department, 2012b and SFFD, 2012b). Construction activities and future maintenance activities for the transmission line in the streets of San Francisco will be performed according to applicable regulations of the San Francisco Municipal Transportation Agency and San Francisco Department of Public Works to ensure that adequate access is maintained for emergency service providers. As described in Section 3.16, Transportation and Traffic, PG&E will coordinate any lane closures with emergency service providers so that response times will not be affected. Coordination with emergency responders will occur prior to construction, and during the construction phase, information will be exchanged daily with all first responders regarding crew locations and areas under construction. In addition, in the event that access is needed by emergency responders where trenching work is being performed, steel plates will be kept on hand that can immediately be placed over the trench to provide access.

Temporary short-term construction activities in the Bay and future operation and maintenance activities on the submarine cable will not require support from the USCG beyond their regular patrol activities. The buried underground and submarine cable will not require additional police or fire protection services. The new 230 kV Potrero Switchyard is essentially a minor expansion of the existing PG&E Potrero Switchyard and will not require additional police or fire protection services beyond what is already provided for the existing neighborhood. Therefore there will be no impact to fire protection or police protection services from construction, operation, and maintenance of the project.

Schools, Parks, and Other Public Facilities

The project does not include development of new residential units and would therefore not increase the demand for schools, parks, or other public facilities in the area. Project construction will result in a temporary increase of approximately 75 construction workers. This is a very small fraction of the existing daytime population of the project area. While it is possible that construction workers traveling to the area may use existing public services or amenities, this potential increase in demand will be minimal and temporary.

Operation and maintenance of the project will not result in an increase in personnel; and will therefore not increase demand on public services, and there will therefore be no impact to schools, parks, or other public facilities from construction, operation, and maintenance of the project.

3.14.5 References

Lapkoff & Gobalet Demographic Research, Inc. 2010. *Demographic Analyses and Enrollment Forecasts for the San Francisco Unified School District*. Online: http://www.sfusd.edu/en/assets/sfusd-staff/enroll/files/DemographicReport3182010.pdf. March 18.

ParkScan San Francisco. 2012. "Parks" information website. Online: http://www.parkscan.org/parks. Accessed May 10.

San Francisco Fire Department (SFFD). 2012a. SFFD website. Online: http://www.sf-fire.org/. Accessed May 8.

San Francisco Fire Department (SFFD). 2012b. Personal communication between Lt. Mary Shtse/SFFD and Lynette Curthoys/Foghorn. July 30, 2012.

San Francisco Planning Department. 2012. Community Facilities Element. Online: http://www.sf-planning.org/ftp/General_Plan/I7_Community_Facilities.htm , accessed May 10, June 1

San Francisco Police Department. 2012a. *San Francisco Police Department 2011 Annual Report*. Online: http://www.sf-police.org/index.aspx?page=3992. Accessed May 8, 2012.

San Francisco Police Department. 2012b. Personal communication between Lt. Rob O'Sullivan, Acting Captain of Bay View Police Station/SFPD and Lynette Curthoys/Foghorn. August 21, 2012.

San Francisco Recreation and Park Department. 2012. Departmental website. Online: http://sfrecpark.org/. Accessed May 9.

San Francisco Unified School District (SFUSD). 2012. SFUSD website. Online: http://www.sfusd.edu/. Accessed May 8.

United States Coast Guard (USCG). 2012. "Eleventh Coast Guard District" website. Online: http://www.uscg.mil/D11/. Accessed May 10.

3.15 Recreation

3.15.1 Introduction

This section describes existing conditions and potential impacts on recreation as a result of construction, operation and maintenance of the project, and concludes there will be no impacts in this area. The project will not introduce new housing or a significant number of jobs into the area that could increase the use of existing parks and will not require the introduction of new park facilities. Access to parks and boating during construction is addressed in Section 3.16, Traffic and Transportation. Temporary construction impacts to parks, such as dust, noise, and hazards, are discussed in the sections pertaining to Air Quality (3.3), Noise (3.12), and Hazards and Hazardous Materials (3.8). Compatibility with future park planning is discussed in Section 3.10, Land Use and Planning.

The proposed project's potential effects on recreational resources were evaluated as provided under the CEQA Guidelines. The significance criteria, as set forth in CEQA Guidelines Appendix G, are summarized in Table 3.15-1. As discussed in more detail below, because there will be no impacts related to recreation, no applicant-proposed measures are necessary.

TABLE 3.15-1
CEQA Checklist for Recreation
Embarcadero-Potrero 230 kV Transmission Project

XV. RECREATION Would the project:	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less-than-Significant Impact**	**No Impact**
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☑
b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☑

3.15.2 Regulatory Background and Methodology

3.15.2.1 Regulatory Background

There is no regulatory background information relevant to addressing project impacts to recreation because the project is a utility project subject to the exclusive discretionary approval authority of the CPUC, and no residential elements are associated with the project.

3.15.2.2 Methodology

Recreation resources include recreational facilities such as state, local and regional parks. The California Department of Parks and Recreation Website (California State Parks, 2012) and the Recreation and Open Space Element of the San Francisco General Plan (San Francisco Planning Department, 2011 and 2012) were reviewed as part of the recreational resources evaluation, as were the websites of the San Francisco Recreation and Park Department (2012) and ParkScan San Francisco (2012). Recreational boating is addressed in Section 3.16 Transportation and Traffic, and recreational fishing is addressed in Section 3.4 Biology.

3.15.3 Existing Setting

Regional

San Francisco is located at the tip of the peninsula defining San Francisco Bay. The San Francisco Bay supports many aquatic recreational activities including sport fishing, sailing, boating, kayaking, swimming, and windsurfing. On the shore of the Bay, the Association of Bay Area Governments (ABAG) has planned the Bay Trail, a 500-mile

shoreline recreational trail. The Bay Trail will eventually encircle San Francisco and San Pablo Bays with a continuous network of hiking and bicycling trails. More than 325 miles of the Bay Trail have been completed. Regional public parks include San Bruno Mountain County and State Park, a 2326-acre park south of San Francisco at the northern end of the Santa Cruz mountains that supports rare plants and butterflies and offers extensive views of San Francisco and the Bay (County of San Mateo, 2012), and the public trails of the 23,000-acre SFPUC Peninsula Watershed, 23,000 acres of the San Francisco peninsula and is a unique natural resource located in a predominantly urbanized region on the San Francisco Peninsula (SFPUC, 2012).

Local

The San Francisco Recreation and Park Department builds, maintains and renovates parks and recreation facilities in San Francisco. There are currently 3,433 acres of local parklands within the city limits. In addition two State Parks cover 255 acres (Candlestick and Mount Sutro) and 1,642 acres of federal parkland are found in the city (Ocean Beach, Fort Funston, Fort Mason, Lands End, Sutro Heights, China Beach, Presidio) (ParkScan San Francisco, 2012). There are 560 additional acres held by various entities (ParkScan San Francisco, 2012). These include 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 the downtown area.

There are no parks adjacent to the project site. Table 3.15-2 lists eight existing parks that are located within half a mile of the project area, and one park with recreational boater access that is within three-quarters of a mile of the in-water portion of the project area. The parks are maintained by the San Francisco Recreation and Park Department, the San Francisco Port Authority, or the San Francisco Municipal Transit Authority. In addition, the Embarcadero is an existing part of the Bay Trail, which provides public open space and pedestrian access and recreational opportunities. Illinois Street near Potrero Switchyard is an unimproved section of the Bay Trail to be developed further as part of the Blue Greenway Trail Project (see Section 3.10, Land Use).

3.15.4 Applicant-Proposed Measures and Potential Impacts

3.15.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, and as summarized in Table 3.15-1, impacts to recreation may be considered significant if the project would increase the use of existing parks causing accelerated deterioration, or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

3.15.4.2 Applicant-Proposed Measures

No applicant proposed measures are suggested for recreation because project construction, operation, and maintenance will have no impact on recreational resources.

3.15.4.3 Impacts

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? *No Impact.*

The project does not include development of new residential units that would increase population; therefore, it will not increase the demand for parks in the project area.

Project construction will result in temporary employment of up to approximately 75 construction workers. This is a very small fraction of the existing daytime population of the project area. While it is possible that construction workers traveling to the area may use existing parks, this potential increase in demand will be minimal and temporary.

Project construction will involve on-water work near the San Francisco shoreline. Water recreation in the project area includes boating, sailing, kayaking, sport-fishing, and canoeing. South Beach Yacht Club at South Beach Harbor and Bay View Boat Club at Pier 52 host sailing races and other activities in the Bay. Kayaks and canoes launched out of Islais Channel may be present in this area. Boaters are also often present in China Basin during ballgames at AT&T Park. Disruption of water-based recreation from the work vessels will be minimal and short-

term. The barge and tug boats that will be used to install the cable and the vessels used at the offshore end of each horizontal directional drill are similar to other vessels that are common in the Bay and along the Port waterfront. Submarine cable installation will occur during an approximately six-month window, and installation of the offshore to onshore transition via horizontal directional drill will occur during an approximately 8-month window. As part of standard in-water construction procedures, PG&E will coordinate with the USCG to ensure that recreational boaters and other mariners are properly notified of construction dates and times, as described further under Section 3.15, Transportation and Traffic. The work zone will occupy an extremely small portion of the available area in the Port, is similar to other Port traffic in the area, and would have no noticeable impact on recreational vessel traffic in the area.

TABLE 3.15-2
San Francisco Parks Near the Project
Embarcadero-Potrero 230 kV Transmission Project

Park Name/Address	Owner	Amenities	Distance
South Park South Park Street and Jack London Alley	San Francisco Recreation and Park Department	Picnic tables, hummingbird garden, tot lots	0.36 mile from Embarcadero Substation
Warm Water Cove Park End of 24th Street and Michigan Street	San Francisco Port Authority	Walking paths, open space, part of the proposed Blue Greenway Plan	0.07 mile from 23rd Street
Woods Yard Park Tennessee Street and 22nd Street	San Francisco Municipal Transit Authority	Open space, children's sand pit	0.16 mile from Illinois Street and 22nd Street
Esprit Park Minnesota Street and 20th Street	San Francisco Recreation and Park Department	Grassy area with redwood trees and picnic tables	0.24 mile form 22nd Street and Illinois Street
Connecticut Friendship Garden Between 22nd and 23rd, Arkansas and Missouri Streets	San Francisco Recreation and Park Department	Community garden park	0.28 mile from Illinois Street and 22nd Street
Potrero Hill Recreation Center Park Arkansas Street between 22nd and 23rd	San Francisco Recreation and Park Department	Community building with classes and programs, stage, gymnasium and auditorium, playground, baseball field, basketball court, dog park, ball fields, tennis courts, picnic tables, BBQ grills	0.47 mile from 22nd and Illinois Street
South Beach Harbor The Embarcadero at Pier 40	Port of San Francisco	Harbor with space for 700 boats. Includes kayak rentals, sailing lessons, and boat rentals	<0.5 miles from the in-water transmission line route
Islais Creek Quint Street and Arthur Avenue	Port of San Francisco	Small pocket park with water access for canoeing and kayaking	<0.75 miles from the in-water transmission line route
Pier 52 Public Boat Ramp The Embarcadero at Pier 52	Port of San Francisco	Public boat ramp with access for trailered boats and kayaks	<0.5 miles from the in-water transmission line route

Note:
Source = ParkScan San Francisco, 2012; BoatingSF.com, 2012

There are no parks adjacent to the project site. Project construction will not interfere with park use or operations, or impede access to any parks. The northern HDD portion of the project will pass under the Embarcadero Promenade. Access to the Embarcadero will not be blocked during construction.

Operation and maintenance of the project will not result in an increase in personnel; therefore the project will not increase the use of parks when the project becomes operational.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? *No Impact.*

The project does not include recreational facilities, nor does it require the construction of new or expanded parks or recreational facilities that could create an adverse physical effect on the environment.

3.15.5 References

BoatingSF.com. 2012. "San Francisco" Web page. Online: http://www.boatingsf.com/region/san-francisco. Accessed August 2.

California Department of Parks and Recreation (California State Parks). 2012. "Find A Park" Website. Online: http://www.parks.ca.gov/ParkIndex/#region-11. Accessed May 13.

County of San Mateo. 2012. "San Bruno Mountain County and State Park" Web page. Online: http://www.co.sanmateo.ca.us/portal/site/parks/menuitem.f13bead76123ee4482439054d17332a0/?vgnextoid=cb7bc8909231e110VgnVCM1000001d37230aRCRD&cpsextcurrchannel=1. Accessed October 10.

ParkScan San Francisco. 2012. "Parks" Web page. Online: http://www.parkscan.org/parks. Accessed May 10.

San Francisco Planning Department. 2011. *Recreation and Open Space Element*. An Element of the General Plan of the City and County of San Francisco. Online: http://openspace.sfplanning.org/docs/Recreation_and_Open_Space_Element_APRIL_2011.pdf. Revised Draft dated June 2011. Accessed May 15.

San Francisco Planning Department. 2012. "Recreation and Open Space Element" Web page. Online: http://www.sf-planning.org/ftp/general_plan/I3_Rec_and_Open_Space.htm. Accessed May 15.

San Francisco Public Utilities Commission (SFPUC). 2012. "Peninsula Watershed" Web page. Online: http://www.sfwater.org/index.aspx?page=199. Accessed October 10.

San Francisco Recreation and Park Department. 2012. Departmental Website. Online: http://sfrecpark.org/. Accessed May 9.

3.16 Transportation and Traffic

3.16.1 Introduction

This section describes existing conditions and potential project-related impacts regarding both land-based and marine traffic and transportation in the project area, as well as applicant-proposed measures to reduce such impacts (APMs TR-1 and -2). The project will not conflict with any applicable transportation policies. Although existing land-based and marine traffic conditions will be temporarily affected by project construction, project impacts to traffic and transportation will be less than significant and will be further reduced with implementation of APMs TR-1 and TR-2 as described in Section 3.16.4.2. Recreational boat traffic is also addressed in Section 3.15, Recreation.

In accordance with Appendix G of the CEQA Guidelines, the potential significance of project impacts on transportation and traffic were evaluated for each of the criteria listed in Table 3.16-1. The project's conformance with the CEQA significance criteria shown in Table 3.16-1 is described in the subsections below. Although marine traffic and transportation is not explicitly addressed under this checklist, that construction-related discussion has been included under the discussion of criterion a) in Section 3.16.4.3.

TABLE 3.16-1
CEQA Checklist for Transportation and Traffic
Embarcadero-Potrero 230 kV Transmission Project

XVI. TRANSPORTATION AND TRAFFIC **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less-than-Significant Impact**	**No Impact**
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☑	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☑	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☑	☐
e) Result in inadequate emergency access?	☐	☐	☑	☐
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☑	☐

3.16.2 Regulatory Background and Methodology

3.16.2.1 Regulatory Background

Federal or Federal Delegated

Transportation of Hazardous Materials 49 CFR 171-177; 49 CFR 350-399; 49 CFR 397.9. The U.S. Department of Transportation (USDOT) and the California Department of Transportation (Caltrans) are the administrating agencies for the following regulations:

- Title 49 Code of Federal Regulations Sections 171 through 177 (49 CFR 171-177) governs the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.
- 49 CFR 350-399 and Appendixes A through G, Federal Motor Carrier Safety Regulations, address safety considerations for the transport of goods, materials, and substances over public highways.
- 49 CFR 397.9, the Hazardous Materials Transportation Act of 1974, directs USDOT to establish criteria and regulations for the safe transportation of hazardous materials.

Inland Navigation Rules Act of 1980 and International Regulations for Preventing Collisions at Sea (International Navigational Rules or 72 COLREGS). These regulations govern the "Rules of the Road" for boat traffic. Rule 9, in both the International and Inland Rules of the Road, provides requirements for vessels navigating in the vicinity of narrow channels or fairways. Vessels and powerboats less than approximately 65 feet (20 meters), all sailboats, and vessels engaged in fishing are required not to impede the passage of a vessel that can safely navigate only within a narrow channel or fairway. Additionally, a vessel shall not cross a narrow channel or fairway if such crossing impedes the passage of a vessel that can safely navigate only within that channel or fairway. A small craft must keep well clear and not hinder or interfere with the transit of larger vessels. Small craft and fishing vessels are required not to anchor or fish in narrow channels if large vessels or barges being towed are transiting. In San Francisco Bay, the Central Bay including the project area is considered to fall under Rule 9 (Harbor Safety Committee of the San Francisco Bay Region, 2011).

Ports and Waterways Safety Act (PWSA) of 1972, as amended by the Port and Tanker Safety Act of 1978 and the Oil Pollution Act of 1990. This act provides for the establishment, operation, and maintenance of vessel traffic services, control of vessel movement, establishment of requirements for vessel operation, and other port safety controls. The Vessel Traffic Services (VTS) Program of the U.S. Coast Guard (USCG), described below, provides essential services to mariners by facilitating the safe and efficient movement of vessel traffic, thereby preventing collisions, groundings, and environmental or economic losses or consequences of these accidents. Initial statutory authority for VTS activities is derived from Title 14 USC which requires the USCG to safeguard the nation's ports, waterways, port facilities, vessels, persons or properties within the vicinity of a port from accidental or intentional destruction or damage.

The Coast Guard uses the establishment of safety zones, a routine and frequent regulation, to establish control of access to maritime areas to ensure the safety of events, vessels, or individuals. Many of these zones are of short duration, ranging from a few hours to a few days, and all are geographically limited in area. Safety zones, defined in 33 CFR 165.20, are established for events such as boat races, bridge repairs, dredging, or salvage operations, or the transit of dangerous cargoes. Safety zones are promulgated by Captains of the Port or District Commanders. These routine and frequent rulemakings support the Coast Guard's broad roles and responsibilities of maritime safety and maritime stewardship (USCG, 2012).

Vessel Traffic Service (VTS). Captains of the Port and their representatives enforce port safety and security and marine environmental protection regulations, including regulations for the protection and security of vessels, harbors, and waterfront facilities; anchorages; security zones; safety zones; regulated navigation areas; deepwater ports; water pollution; and ports and waterways safety. Vessel Traffic Services are delegated authority under the Ports and Waterways Safety Act to discharge the duties of the Captain of the Port that involve directing the operation, movement, and anchoring of vessels within a VTS area, including management of vessel traffic

within anchorages, regulated navigation areas and safety zones, and to enforce VTS and ports and waterways safety regulations (USCG, 2005; USCG, 2012).

USCG 11th District established the VTS in San Francisco Bay in 1972. The Vessel Traffic Center is located on Yerba Buena Island in San Francisco Bay. On 3 May 1995, federal regulations went into effect establishing regulated navigation areas within the San Francisco Bay Region. These regulations, developed with input from the Harbor Safety Committee of the San Francisco Bay Region, were designed to improve navigation safety by organizing traffic flow patterns; reducing meeting, crossing, and overtaking situations in constricted channels; and limiting vessels' speeds. The geographic area served by VTS San Francisco includes San Francisco Bay, its seaward approaches, and its tributaries as far as Stockton and Sacramento. VTS implements and enforces the portions of the Ports and Waterways Safety Act that enhance navigation, vessel safety and marine environmental protection and promote safe vessel movement by reducing the potential for collisions, allisions and groundings, and the loss of lives and property associated with these incidents. The Coast Guard operates the VTS system and monitors nearly 400 vessel movements per day.

For purposes of traffic management throughout the VTS area, VTS San Francisco is divided into two Sectors: Offshore and Inshore. The project is located within the Inshore Sector. Active participation by vessels that fall under the Vessel Movement Report System (33 CFR 161.16) is characterized by the use of three reports: a Sailing Plan (for vessels 40 meters or more in length and for their towing vessels) including information on position, destination, and route; position reports; and a final report upon docking, anchoring, or leaving the area. Construction projects such as the cable laying would contact VTS daily so that information on the construction activities and the established Vessel Safety Zone could be included in navigational advisories, and may be included in a Local Notice to Mariners (USCG, 2005; 2012).

Regulated Navigation Areas (RNAs) 33 CFR Parts 162 and 1650.

The USCG has established regulated navigation areas (RNAs) within the San Francisco Bay region to reduce vessel congestion where maneuvering room is limited. These RNAs increase navigational safety by organizing traffic flow patterns; reducing meeting, crossing, and overtaking situations between large vessels in constricted channels; and limiting vessel speed. Traffic flow within the Bay is guided by a series of RNAs; all vessels are required to follow the San Francisco Bay traffic routing system. Any decision to deviate from the RNA must be made by the master or person in charge of the vessel with notification to the VTS prior to deviating from RNA. The RNAs apply to large vessels (1,600 gross tons or more, or tugs towing these) and will apply to the barge and tugs used during construction. The cable route is located within the San Francisco Bay RNA, and within the Central Bay Precautionary Area, an area within the RNA in which one-way traffic flow is not possible. The cable route is located west of and outside designated anchorage areas.

State or State Delegated

California Vehicle Code (CVC). Caltrans is the administrating agency for the following regulations:

- CVC Sections 13369, 15275, and 15278 address the licensing of drivers (and classifications of licenses) required to operate particular types of vehicles as well as certificates permitting the operation of vehicles transporting hazardous materials.
- CVC Sections 25160 *et seq*. address the safe transport of hazardous materials.
- CVC Sections 2500-2505 authorize the issuance of licenses by the Commissioner of the California Highway Patrol to transport hazardous materials, including explosives.
- CVC Sections 31300 *et seq*. regulate the highway transportation of hazardous materials, routes used, and restrictions. CVC Section 31303 requires that hazardous materials be transported on state or interstate highways that offer the shortest overall transit time possible.
- CVC Sections 31600-31620 regulate the transportation of explosive materials.
- CVC Sections 32000-32053 regulate the licensing of carriers of hazardous materials and include noticing requirements.

- CVC Sections 32100-32109 establish special requirements for the transportation of substances presenting inhalation hazards and poisonous gases. CVC Section 32105 requires shippers of inhalation hazards or explosive materials to contact the California Highway Patrol and apply for a Hazardous Material Transportation License. Upon receiving this license, the shipper will obtain a handbook specifying approved routes.
- CVC Sections 34000-34121 establish special requirements for transporting flammable and combustible liquids over public roads and highways.
- CVC Sections 34500, 34501, 34501.2-4, 34501.10, 34505.5-7, 34506, 34507.5, and 34510-11 regulate the safe operation of vehicles, including those used to transport hazardous materials.
- California Street and Highways Code (S&HC) Sections 660, 670, 1450, 1460 *et seq*., 1470, and 1480 regulate right-of-way (ROW) encroachment and granting of permits for encroachments on state and county roads.
- S&HC Sections 117 and 660-711 and CVC Sections 35780 *et seq*. require permits to transport oversized or excessive loads on county roads. S&HC Sections 117 and 660-711 also require permits for any construction, maintenance, or repair involving encroachment on state highway ROWs. CVC Section 35780 requires approval for a permit to transport oversized or excessive loads over state highways.
- Caltrans weight and load limitations for state highways apply to all state and local roadways. The weight and load limitations are specified in the CVC Sections 35550-35559. The following provisions from the CVC apply to all roadways and are therefore applicable to this project:

  General Provisions:

  - The gross weight imposed upon the highway by the wheels on any axle of a vehicle shall not exceed 20,000 pounds, and the gross weight upon any one wheel or wheels supporting one end of an axle and resting upon the roadway shall not exceed 10,500 pounds.
  - The maximum wheel load is the lesser of the following: (1) the load limit established by the tire manufacturer, or (2) a load of 620 pounds per lateral inch of tire width, as determined by the manufacturer's rated tire width.

  Vehicles with Trailers or Semitrailers:

  - The gross weight imposed upon the highway by the wheels on any one axle of a vehicle shall not exceed 18,000 pounds, and the gross weight upon any one wheel or wheels supporting one end of an axle and resting upon the roadway shall not exceed 9,500 pounds, except that the gross weight imposed upon the highway by the wheels on any front steering axle of a motor vehicle shall not exceed 12,500 pounds.
- California State Planning Law, Government Code Section 65302 requires each city and county to adopt a General Plan, consisting of seven mandatory elements, to guide its physical development. Section 65302(b) requires that a circulation element be one of the mandatory elements.
- All construction in the public ROW must comply with the *California Joint Utility Traffic Control Manual* (California Joint Utility Traffic Control Committee, 2010).

Emergency Water Transportation System Management Plan

The Water Emergency Transportation Authority (WETA) is a regional agency authorized by the State to operate a comprehensive San Francisco Bay Area public water transit system. In 2009, the WETA adopted the Emergency Water Transportation System Management Plan, which complements and reinforces other transportation emergency plans that will enable the Bay Area to restore mobility after a regional disaster (WETA, 2012).

Regional and Local

Because CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary regulations. The following analysis of local regulations relating to transportation is provided for informational purposes and to assist with CEQA review.

San Francisco Bay Trail Plan

The Association of Bay Area Governments (ABAG) administers the San Francisco Bay Trail Plan (Bay Trail Plan). The Bay Trail is a multi-purpose recreational trail that, when complete, will encircle San Francisco Bay and San Pablo Bay with a continuous 500-mile network of bicycling and hiking trails. To date, 310 miles of the alignment have been completed. The 2005 Gap Analysis Study, prepared by ABAG for the entire Bay Trail area, attempted to identify the remaining gaps in the Bay Trail system; classify the gaps by phase, county, and benefit ranking; develop cost estimates for individual gap completion; identify strategies and actions to overcome gaps; and present an overall cost and timeframe for completion of the Bay Trail system. In the project area near the northern onshore underground alignment, the Bay Trail has been completed and runs along The Embarcadero. In the project area near the southern onshore underground alignment, the Bay Trail is unfinished and runs along Illinois Street (San Francisco Bay Trail Project, 2010).

PG&E is a member of the California Joint Utility Traffic Control Committee, which in April 2010 published the *California Joint Utility Traffic Control Manual*. The traffic control plans and associated text depicted in this manual conform to the guidelines established by the *California Manual on Uniform Traffic Control Devices for Street and Highways* 2010 Edition (Caltrans, 2010) regarding basic standards for the safe movement of traffic upon highways and streets in accordance with Section 21400 of the California Vehicle Code. These recommendations include provisions for safe access of police, fire, and other rescue vehicles. In addition, PG&E would apply for an Excavation Permit and a Special Traffic Permit from the City.

2011 San Francisco Congestion Management Program

The 2011 SFCMP (SFCTA, 2011) guides San Francisco agencies involved in congestion management, sets forth policies and technical tools to implement the Congestion Management Program (CMP) work program, and ensures the City's conformance with CMP legislation created by the State of California. The 2011 SFCMP establishes traffic level of service (LOS) standards consistent with CMP-mandated criteria. The LOS standard was established at LOS E in the initial 1991 CMP network. Facilities that were already operating at LOS F at the time of baseline monitoring conducted to develop the first CMP in 1991 are legislatively exempt from the LOS standards. CMP segments that are within a designated Infill Opportunity Zone (IOZ) are also exempt from LOS conformance requirements. I-80 between Fremont Street and U.S. 101 was operating at LOS F in the first CMP in 1991, and is therefore exempt from the LOS standards. In addition, all local roads within the study area (Folsom Street, Spear Street, and 23rd Street) are all within IOZs, and therefore are also exempt from LOS standards.

All freeway and arterial segments are monitored using the floating vehicle method, which allows for determination of LOS on the basis of average operating speed. SFCTA uses the 1985 Highway Capacity Manual (Transportation Research Board, 1985) methodology to monitor LOS on the CMP network for freeways. SFCTA uses the HCM 2000 (Transportation Research Board, 2000) methodology to monitor LOS on arterials, which is described in detail in section 3.16.3.2.

San Francisco General Plan

The Transportation Element of the San Francisco General Plan (San Francisco Planning Department, 2010a) is composed of objectives and policies that relate to the eight aspects of the citywide transportation system: General Regional Transportation, Congestion Management, Vehicle Circulation, Transit, Pedestrian, Bicycles, Citywide Parking, and Goods Management. The Transportation Element references San Francisco's "Transit First" Policy in its introduction, and contains the following objectives and policies that are directly pertinent to consideration of the proposed project:

- Objective 1: Meet the needs of all residents and visitors for safe, convenient and inexpensive travel within San Francisco and between the City and other parts of the region while maintaining the high quality living environment of the Bay Area.
  - Policy 1.2: Ensure the safety and comfort of pedestrians throughout the City.

  - Policy 1.3: Give priority to public transit and other alternatives to the private automobile as the means of meeting San Francisco's transportation needs, particularly those of commuters.
  - Policy 1.4: Increase the capacity of transit during the off-peak hours.
  - Policy 1.5: Coordinate regional and local transportation systems and provide for interline transit transfers.
  - Policy 1.6: Ensure choices among modes of travel and accommodate each mode when and where it is most appropriate.
- Objective 2: Use the transportation system as a means for guiding development and improving the environment.
  - Policy 2.1: Use rapid transit and other transportation improvements in the city and region as the catalyst for desirable development, and coordinate new facilities with public and private development.
  - Policy 2.4: Organize the transportation system to reinforce community identity, improve linkages among interrelated activities, and provide focus for community activities.
- Objective 9: Improve bicycle access to San Francisco from all outlying corridors.
  - Policy 9.2: Where bicycles are prohibited on roadway segments, provide parallel routes accessible to bicycles or shuttle services that transport bicycles.
- Objective 11: Establish public transit as the primary mode of transportation in San Francisco and as a means through which to guide future development and improve regional mobility and air quality.
- Objective 14: Develop and implement a plan for operational changes and land use policies that will maintain mobility and safety, despite a rise in travel demand that could otherwise result in system capacity deficiencies.
  - Policy 14.2: Ensure that traffic signals are timed and phased to emphasize transit, pedestrian, and bicycle traffic as part of a balanced multimodal transportation system.
  - Policy 14.3: Improve transit operation by implementing strategies that facilitate and prioritize transit vehicle movement and loading.
  - Policy 14.4: Reduce congestion by encouraging alternatives to the single-occupancy auto through the reservation of right-of-way and enhancement of other facilities dedicated to multiple modes of transportation.
  - Policy 14.7: Encourage the use of transit and other alternative modes of travel to the private automobile through the positioning of building entrances and the convenient location of support facilities that prioritizes access from these modes.
- Objective 19: Provide for convenient movement among districts in the City during off-peak travel periods and safe traffic movement at all times
  - Policy 19.2: Promote increased traffic safety, with special attention to hazards that could cause personal injury.
- Objective 23: Improve the city's pedestrian circulation system to provide for efficient, pleasant, and safe movement.
  - Policy 23.2: Widen sidewalks where intensive commercial, recreational, or institutional activity is present and where residential densities are high.
  - Policy 23.3: Maintain a strong presumption against reducing sidewalk widths, eliminating crosswalks, and forcing indirect crossings to accommodate automobile traffic.

  - Policy 23.6: Ensure convenient and safe pedestrian crossings by minimizing the distance pedestrians must walk to cross a street.

- Objective 24: Improve the ambiance of the pedestrian environment.
- Objective 28: Provide secure and convenient parking facilities for bicycles.
  - Policy 28.1: Provide secure bicycle parking in new governmental, commercial, and residential developments.
  - Policy 28.3: Provide parking facilities which are safe, secure, and convenient.

Transit-First Policy

In 1998, the San Francisco voters amended the City Charter (Charter Article 8A, Section 8A.115) to include a Transit-First Policy, which was first articulated as a City priority policy by the Board of Supervisors in 1973. The Transit-First Policy is a set of principles that underscore the City's commitment that travel by transit, bicycle, and foot be given priority over the private automobile. These principles are embodied in the policies and objectives of the Transportation Element of the San Francisco General Plan. All City boards, commissions, and departments are required, by law, to implement transit-first principles in conducting City affairs.

Transbay Redevelopment Plan

The Transbay Redevelopment Plan (San Francisco Redevelopment Agency, 2005) was adopted by the City of San Francisco in June 2005, and will facilitate the development plans surrounding the Transbay Transit Center currently under construction. Folsom Street is the southeastern boundary of the Transbay Redevelopment Plan area, and is planned to be the centerpiece of the new neighborhood with widened sidewalks and street-level retail. The Transbay Redevelopment Plan contains the following objectives:

- Objective B1: Coordinate efforts with transit agencies regionally to enhance the availability of public transportation to and from the Transbay area and to enhance the attractiveness, safety, and functionality of transit stop locations.
- Objective B2: Facilitate the installation of bike lanes and bike facilities in coordination with the Department of Parking and Traffic according to the San Francisco Bike Plan.
- Objective D1: Create a boulevard on Folsom Street from Second Street to the Embarcadero to serve as a pedestrian promenade while maintaining it as a vehicular route.

Rincon Hill Area Plan

The Streets and Transportation Element of the Rincon Hill Area Plan (San Francisco Planning Department, 2005) is composed of objectives and policies that relate to elements such as pedestrian networks and safety, transit service, parking supply, and bicycles. The Rincon Hill Area Plan contains the following objectives and policies that are pertinent to transportation in the vicinity of the proposed project:

- Policy 5.3: Transform Folsom Street into a grand civic boulevard, per this plan and the Transbay Redevelopment Plan.
- Policy 5.8: Explore the feasibility of and implement if feasible the following transit improvements for Rincon Hill. Long-term: Create Bus Rapid Transit in the Folsom Street corridor, including dedicated transit lanes, special stops, and traffic signal priority.

San Francisco Bicycle Plan

The San Francisco Bicycle Plan (San Francisco Municipal Transportation Agency [SFMTA], 2009) describes a City program to provide the safe and attractive environment needed to promote bicycling as a transportation mode. The San Francisco Bicycle Plan identifies the citywide bicycle route network and establishes the level of treatment on each route. The Plan also identifies near-term improvements that could be implemented within the next five years, as well as policy goals, objectives and actions to support these improvements. It also includes long-term

improvements as well as and minor improvements that would be implemented to facilitate bicycling in San Francisco.

Better Streets Plan

The San Francisco Better Streets Plan (San Francisco Planning Department, 2010b) focuses on creating a positive pedestrian environment through measures such as careful streetscape design and traffic calming to increase pedestrian safety. The Better Streets Plan includes guidelines for the pedestrian environment, which it defines as the areas of the street where people walk, shop, sit, play, or interact. Generally speaking, the guidelines are for design of sidewalks and crosswalks; however, in some cases, the Better Streets Plan includes guidelines for certain areas of the roadway, particularly at intersections.

3.16.2.2 Methodology

Traffic data and other transportation system information were obtained from maps, literature searches, and aerial photos (see Section 3.16.5, References). Traffic volumes for regional roadways in the study area were obtained from the Caltrans District 4 website, while traffic volumes for local roadways were obtained from the San Francisco Municipal Transportation Agency website. Transit data were obtained from various transit agency websites, as well as the 511.org website. The thresholds in the 2011 San Francisco Congestion Management Program (2011 SFCMP; San Francisco County Transportation Authority [SFCTA], 2011) were taken into consideration in the evaluation of impacts. The information was then used to evaluate the project using the CEQA Checklist to determine potential impacts.

3.16.3 Environmental Setting

This section includes a description of the roadways that will be used by workers and delivery trucks during construction. Access routes will vary depending on the origin of the worker or truck, and the type of activity that day. Therefore, the roads that are most likely to be affected are described. The highest-volume roadways are described first.

3.16.3.1 Regional Roadways

Interstate 80 (I-80) provides regional access to Embarcadero Substation and the northern onshore underground portion of the project route. I-80 connects San Francisco to the East Bay and points further east via the San Francisco-Oakland Bay Bridge. I-80 and U.S. Highway 101 (U.S. 101) connect to the south of the project area, and U.S. 101 provides regional access to the Peninsula/South Bay area. I-80 connects to downtown San Francisco surface streets at various intersections, with the closest to the project site at Fremont Street/Folsom Street, Fremont Street/Harrison Street, First Street/Harrison Street, and Essex Street/Harrison Street. I-80 is ten lanes wide across the Bay Bridge, and six to eight lanes wide south of downtown San Francisco. Caltrans (2011) reports an average of about 173,000 vehicles per day on I-80 near the Fremont St. interchange. According to the 2011 SFCMP, I-80 is operating at LOS F in the PM peak in both directions between U.S. 101 and Fremont Street.

Interstate 280 (I-280) provides regional access to Potrero Switchyard and the southern onshore underground route. I-280 is a regional freeway that connects San Francisco with the greater San Jose area and serves as a major commuter route between the two cities. The most direct access between Potrero Switchyard and I-280 is at the Cesar Chavez Street/25th Street interchange via Illinois Street. Caltrans (2011) reports an average of 111,000 vehicles per day on I-280 near the Cesar Chavez Street/25th Street interchange. According to the 2011 SFCMP, I-280 is operating at LOS E and D in the northbound and southbound directions, respectively, in the PM peak between near the Cesar Chavez Street/25th Street interchange.

3.16.3.2 Local Roadways

Table 3.16-2 provides a summary of the road segments that are directly along the northern and southern onshore underground portions of the transmission line route. Descriptions of the roadways follow below.

TABLE 3.16-2
Summary of Road Segments along Proposed Transmission Line Route
Embarcadero-Potrero 230 kV Transmission Project

Roadway	Segment	Vehicle Lanes	Parking Lanes	Two-Way Operation	ADT[1]	AM/PM Existing Roadway LOS[2]	Bicycle Facility	Transit Routes
Northern Portion								
Spear St	Embarcadero to Harrison	2	2	Yes	Data N/A	Data N/A	None	None
	Harrison to Folsom	2	2	One-Way Southbound	5,700	Data N/A	None	None
Folsom St	Spear to Main	4	2	Yes	8,100	E/E	Bike Lane	SF Muni (82X)
	Main to Beale	4	0	Yes	Data N/A	E/E	Bike Lane	SF Muni (38, 38L, 71, 71L, 82X, 108) GG Transit[3] AC Transit[4] WestCAT (Lynx)
	Beale to Fremont	4	1	Yes	15,600	E/E	Bike Lane	SF Muni (108) GG Transit[3] AC Transit[4] SamTrans (KX, 391, 397) WestCAT (Lynx)
	Fremont to 1st	4	1	Yes	12,600	E/E	Bike Lane	SF Muni (76, 108) GG Transit[3] AC Transit[4] SamTrans (391, 397) WestCAT (Lynx)
Southern Portion								
23rd St	Illinois to DHL Gate[5]	2	2	Yes	Data N/A	Data N/A	None	None

Notes:
N/A = not available
[1] Average Daily Traffic data for the City of San Francisco, 2005-2011 (SFMTA, 2011)
[2] *2011 San Francisco Congestion Management Program* (SFCTA, 2011)
[3] Golden Gate Transit routes include 10, 70, 80, 101, and 101X.
[4] AC Transit Transbay routes include 800, B, C, CB, E, F, FS, G H, J, L, LA, LC, NL, NX, NX1, NX2, NX3, NX4, NXC, O, OX, P, S, SB, V, W, and Z.
[5] DHL warehouse gate is located on 23rd Street approximately 800 feet east of Illinois St.

The operational characteristics of the urban street segments were evaluated using the average through-vehicle travel speed, as defined in the *Highway Capacity Manual 2000* (Transportation Research Board, 2000). The urban street LOS criteria are based on average travel speed and urban street class. Table 3.16-3 lists the urban street LOS criteria as defined in the HCM 2000. The average speed along urban streets is influenced both by density of signals (number per mile) and by the intersection control delay. Less-than-optimal signal timing and increased traffic demand can degrade the LOS.

TABLE 3.16-3
Urban Street LOS by Class
Embarcadero-Potrero 230 kV Transmission Project

	Urban Street Class			
Free-Flow Speeds (FSS) Parameter	**I**	**II**	**III**	**IV**
Range of FFS	55 to 45 mph	45 to 35 mph	35 to 30 mph	35 to 25 mph
Typical FFS	50 mph	40 mph	35 mph	30 mph
LOS	**Average Travel Speed**			
A	>42 mph	>35 mph	>30 mph	>25 mph
B	>34-42 mph	>28-35 mph	>24-30 mph	>19-25 mph
C	>27-34 mph	>22-28 mph	>18-24 mph	>13-19 mph
D	>21-27 mph	>17-22 mph	>14-18 mph	>9-13 mph
E	>16-21 mph	>13-17 mph	>10-14 mph	>7-9 mph
F	≤16 mph	≤13 mph	≤10 mph	≤7 mph

Note:
Source = *Highway Capacity Manual 2000* (Transportation Research Board, 2000).

Arterial Roads

Folsom Street is a two-way, four-lane, east-west, major arterial (as designated by the 2011 SFCMP) between Spear Street to the east and First Street to the west. Between First Street and Spear Street, Folsom Street has three eastbound lanes and one westbound lane. West of First Street, Folsom Street transitions into one-way operation in the eastbound direction. Folsom Street is a primary eastbound connector to the I-80 freeway ramps in the South of Market area. Folsom Street has a Class II bicycle lane between First Street and Spear Street, as well as sidewalks along both sides of the street. On-street parking is allowed on both sides of Folsom Street between Spear Street and Main Street. Parking is only allowed on the east side of Folsom Street between Beale Street and First Street. Folsom Street has a bus-only lane in the westbound direction between the Transbay Temporary Terminal bus station and Essex Street to facilitate the efficient movement of buses between the Temporary Terminal and the Bay Bridge. According to the 2011 SFCMP, Folsom Street in the eastbound direction between First Street and the Embarcadero operates at LOS E in both AM and PM peak hours. Folsom Street is considered a Class III arterial, based on the HCM 2000 methodology. The average daily traffic along Folsom Street in the eastbound direction is 15,600 vehicles per day (vpd) between Fremont Street and Beale Street.

Local Roads

Spear Street is a two-lane, north-south, local road between Market Street to the north and a cul-de-sac just south of Harrison Street at its southern terminus. Spear Street operates one-way southbound between Market Street and Harrison Street, and changes to two-way operation south of Harrison Street. There are sidewalks and on-street parking on both sides of Spear Street along the proposed project route. The average daily traffic on southbound Spear Street between Folsom Street and Harrison Street is 5,700 vpd.

23rd Street is a two-way, two-lane, east-west, local road between Pennsylvania Avenue to the west and the eastern terminus just east of Potrero Switchyard at the DHL Warehouse gate. 23rd Street between Illinois Street and the DHL Gate has a sidewalk on the north side of the road and on-street parking on both sides. There are no bicycle facilities or transit routes on this segment of 23rd Street, as the road segment is primarily surrounded by industrial land use. Spear Street and 23rd Street were not included as monitored road segments in the 2011 SFCMP.

3.16.3.3 Public Transit

There are no public rail lines or stations immediately along the proposed transmission line route. To the north, through downtown San Francisco, there are transit lines operated by Bay Area Rapid Transit (BART), Cal Train, and SF Muni Train. The closest rail line to Potrero Switchyard is route KT operated by SF Muni Train, which runs along Third Street.

Transbay Temporary Terminal

The Transbay Temporary Terminal is located along the block bounded by Beale Street to the southwest, Howard Street to the northwest, Main Street to the northeast, and Folsom Street to the southeast. The Transbay Temporary Terminal provides bus terminal facilities during demolition of the old Transbay Terminal and construction of the new multi-modal Transbay Transit Center (expected to open in 2017). The terminal serves SF Muni, Golden Gate Transit, AC Transit, SamTrans, WestCAT, and Greyhound. Between the proposed construction hours of 7 a.m. and 8 p.m. there are approximately 1,380 bus trips that use Folsom Street to travel to and from the Transbay Temporary Terminal (SFCTA, 2012).

San Francisco Municipal Transit Agency (SF Muni Bus)

SF Muni is the transit division of the SFMTA, and provides local bus and light rail service within the project area. There are seven Muni bus lines along the proposed northern transmission line route at Folsom Street, including routes 38, 38L, 71, 71L, 76, 82X, and 108. Between the proposed construction hours of 7 a.m. and 8 p.m., SF Muni provides approximately 735 bus trips to and from the Transbay Temporary Terminal via Folsom Street. There is one bus stop along the proposed route at Folsom Street between Main Street and Beale Street in the eastbound direction (Metropolitan Transportation Commission, 2012b).

There are no transit routes along the proposed southern portion of the transmission line route at 23rd Street. The closest transit service to the proposed southern route is the light rail (Muni Metro) route T along Third Street, with a station at 23rd Street and Third Street.

Golden Gate Transit

Golden Gate Transit provides regional transit service between San Francisco and the northern Bay Area communities via the Golden Gate Bridge. Golden Gate Transit offers five different routes that serve the Transbay Temporary Terminal along the proposed northern transmission line route along Folsom Street. The routes include 10, 70, 80, 101, and 101X. Between the proposed construction hours of 7 a.m. and 8 p.m., Golden Gate Transit provides approximately 90 bus trips to and from the Transbay Temporary Terminal via Folsom Street. There are no bus stops that serve Golden Gate Transit routes along the proposed transmission line route (Golden Gate Bridge, Highway and Transportation District, 2012b).

Alameda-Contra Costa Transit District (AC Transit)

AC Transit provides regional transit service between San Francisco and the eastern Bay Area communities from Richmond to Fremont. AC Transit provides regional bus service to the Transbay Temporary Terminal via the I-80 Bay Bridge, Fremont Street, and Folsom Street. Most transbay service is peak-hour and peak-direction (west to San Francisco during the AM peak period and east from San Francisco during the PM peak period), with headways of 15 to 30 minutes per route. The AC Transit routes include 800, B, C, CB, E, F, FS, G, H, J, L, LA, LC, NL, NX, NX1, NX2, NX3, NX4, NXC, O, OX, P, S, SB, V, W, and Z. Between the proposed construction hours of 7 a.m. and 8 p.m., AC Transit provides approximately 450 bus trips to and from the Transbay Temporary Terminal via Folsom Street. There are no bus stops that serve AC Transit routes along the proposed transmission line route (AC Transit, 2012).

San Mateo County Transit District (SamTrans)

SamTrans provides regional bus service between San Francisco and the southern Bay Area communities from Daly City to Palo Alto. SamTrans provides regional bus service to the Transbay Temporary Terminal via Mission Street, Fremont Street, and Folsom Street, including routes KX, 391, and 397. Between the proposed construction hours of 7 a.m. and 8 p.m., SamTrans provides approximately 50 bus trips along Folsom Street near the Transbay Temporary Terminal. There is a designated layover area for SamTrans buses on the south side of Folsom Street between Main Street and Beale Street (SamTrans, 2012).

Western Contra Costa Transit Authority (WestCAT)

WestCAT provides regional bus service between San Francisco and the Hercules Transit Center through a service called Lynx. The Lynx route serves the Transbay Temporary Terminal via the I-80 Bay Bridge and Folsom Street. Between the proposed construction hours of 7 a.m. and 8 p.m., WestCAT Lynx provides approximately 50 bus trips to and from the Transbay Temporary Terminal. No bus stops serve WestCAT routes along the proposed transmission line route (WestCAT, 2012).

Greyhound

Greyhound operates a terminal facility at the Transbay Temporary Terminal, providing regional passenger and package express bus service to Bakersfield, Fresno, Los Angeles, Modesto, Oakland, San Fernando, and San Jose (Greyhound, 2012). The Greyhound terminal building and driveway is located on the west side of Folsom Street between Main Street and Beale Street.

3.16.3.4 Bicycle Facilities

Existing bicycle facilities are part of the San Francisco Bicycle Network. Bikeways are typically classified as Class I, II, or III facilities. Class I bikeways are paths with exclusive right-of-way for use by bicycles and/or pedestrians. Class II bikeways are bike lanes striped within the paved areas of roadways and established for the preferential use of bicycles. Class III bikeways are signed bicycle routes where pavement markings called "sharrows" are used to inform bicyclists and motorists to share the road space. One Class II bikeway is found in the project area, located along the proposed northern transmission line route at Folsom Street between First Street and Spear Street. This bike lane is part of the MTC Regional Bicycle Network. No bike lanes are present on Spear Street or 23rd Street. The closest bikeway to the proposed southern onshore underground alignment is a Class II bikeway on Illinois Street (San Francisco Bicycle Coalition, 2012).

3.16.3.5 Pedestrian Facilities

Pedestrian facilities are found along the entire northern portion of the proposed project route, including sidewalks along both sides of Spear Street and Folsom Street. All intersections along the proposed northern route are signalized with marked crosswalks. At the southern portion of the proposed project route, there is a sidewalk only on the north side of 23rd Street.

3.16.3.6 Parking Facilities

On-street parking exists along most of the northern portion of the proposed project route, with the exception of the north side of Folsom Street between Main Street and Fremont Street. Folsom Street between Main Street and Fremont Street includes a bus-only lane in the westbound direction, and on-street parking is restricted; 17 parking spaces are found between Beale and Main Streets on the northbound lanes, and 10 car and 4 motorcycle spaces are found between Spear and Main on the southbound direction. On-street parking within the downtown area is generally one-hour or two-hour metered or unmetered time-limited parking. Spear Street supports 51 car and 12 motorcycle parking spaces between Harrison and the cul-de-sac, and 31 car spaces including 21 on the north side and 10 on the south side between Harrison and Folsom.

There is on-street parking along both sides of 23rd Street east of Illinois Street towards the DHL Warehouse gate. On the south side, there are about nine parallel parking spaces. On the north side, parking is unmarked and approximately 50 to 55 spaces can be used depending on the parking distances used.

3.16.3.7 Marine Navigation Transportation and Traffic

The Bay presents a number of hazards to navigation, such as strong tides and currents and variable bottom depths, which confine large vessels to defined shipping lanes within the Bay. Navigating the Bay becomes more complex during periods of restricted visibility. Currents in the Bay can reach over 4 knots at the Golden Gate; south of the Bay Bridge along the San Francisco waterfront these are generally under 2 knots.

Thus, vessel traffic in the Bay consists of a complex variety of inbound and outbound vessels, wholly in-Bay vessel movements, tugs, government vessels, passenger ferry ships, recreational boats, commercial and sport fishing boats, board sailors, and personal watercraft (jet skis) within a series of bays, channels and rivers that comprise the San Francisco Bay planning area (Harbor Safety Commission of the San Francisco Bay Area [HSC], 2011). A tug escort is required for large vessels within the submarine cable area (HSC, 2012). As described above in Section 3.16.2, the project lies within the San Francisco Bay RNA and vessel traffic is monitored continuously in the project area by the VTS. The submarine route is located west of the established north/south shipping lanes used by commercial and naval traffic that travel into and out of the Bay. Designated anchorage areas are located east and southeast of the submarine route (NOAA, 2012). In addition, an expanding ferry system annually makes over 85,000 trips, mainly to and from San Francisco in the central part of the Bay. Because much of the Bay shoreline is urbanized, recreational boating and the growing sports of board sailing and paddle sports are popular, with an estimated 20,000 boat berths around the Bay (HSC, 2011).

Three passenger ferry routes serving AT&T Park cross the proposed project submarine route. Golden Gate Transit operates the Giants Ferry passenger ferry route from the Larkspur Ferry Terminal (Golden Gate Bridge, Highway and Transportation District, 2012a). Blue & Gold Fleet provides passenger ferry service to Oakland and Alameda Ferry Terminals (Blue & Gold Fleet, 2012). Vallejo Baylink (2012) is a passenger ferry service owned by the City of Vallejo and operated by Blue & Gold Fleet, and provides service to the Vallejo Ferry Terminal. Passenger ferry service to AT&T Park operates between April and October for San Francisco Giants baseball home games. Each service operates one ferry boat along the route and picks passengers up at McCovey Cove, with service to AT&T Park usually arriving 20 to 40 minutes prior to game time. Ferries typically depart AT&T Park 20 minutes after the last out on weeknights, or 11:30 pm, whichever is first.

South Beach Harbor, located between Pier 40 and AT&T Park, is a full service marina, consisting of 700 slips with concrete docks and a 640-foot recreational and commercial Guest Dock. South Beach Harbor was built in 1986 by the San Francisco Redevelopment Agency on property leased from the Port of San Francisco. The marina does not have a fuel dock or public boat launch.

3.16.3.8 Air Traffic

There are no airports or heliports within the vicinity of the project. A helipad is being constructed as part of the UCSF hospital complex.

3.16.4 Applicant-Proposed Measures and Potential Impacts

3.16.4.1 Significance Criteria

According to the CEQA significance criteria (Table 3.16-1), proposed projects that create a substantial increase in traffic relative to existing traffic volumes, exceed adopted traffic level of service standards, increase traffic hazards, result in inadequate emergency access, or exceed parking capacity may result in a significant effect. Typically these are proposed projects that would generate or attract traffic at a particular location or that would obstruct traffic for a time. To determine the significance of the impacts anticipated from the proposed project, the project's effects were evaluated as provided under Appendix G of the CEQA guidelines.

Assessment of impacts related to construction of the proposed project involved evaluating the effects of the proposed project on traffic and circulation resulting from increases in traffic, loss of vehicle/bicycle travel lanes and/or parking areas, disruptions to public transit, and potential safety effects associated with proposed construction. Proposed construction characteristics, including manpower and equipment, location of construction, and rate of construction, were determined on the basis of information provided by PG&E, also summarized in Chapter 2, Project Description. Conservative assumptions were used to determine the potential number of vehicles that would be required for project construction.

3.16.4.2 Applicant-Proposed Measures

APM Transportation and Traffic (TR)-1: Traffic Management Implementation. PG&E will follow its standard safety practices, including installing appropriate barriers between work zones and transportation facilities, posting adequate signs, and using proper construction techniques. PG&E will coordinate construction traffic access at Embarcadero Substation and Potrero Switchyard with SFMTA during project construction. PG&E is a member of the California Joint Utility Traffic Control Committee, which published the *California Joint Utility Traffic Control Manual* (2010). PG&E will follow the recommendations in this manual regarding basic standards for the safe movement of traffic on highways and streets in accordance with Section 21400 of the CVC. These recommendations include provisions for safe access of police, fire, and other rescue vehicles.

In addition, PG&E will apply for an Excavation Permit and a Special Traffic Permit from the City of San Francisco, and will also submit a Traffic Management Plan to the City as part of his application. The Traffic Management Plan will include the following elements and activities:

- Consult with SF Muni at least one month prior to construction to coordinate bus stop relocation (as necessary) and to reduce potential interruption of transit service, especially to the Transbay Temporary Terminal.
- Include a discussion of work hours, haul routes, limits on lengths of open trench, work area delineation, traffic control and flagging.
- Identify all access and parking restrictions and signage requirements, including any bicycle route or pedestrian detours, should the need for these arise during final design.
- Lay out a plan for notifications and a process for communicating with affected residents and businesses prior to the start of construction. Advance public notification would include postings of notices and appropriate signage of construction activities. The written notification shall include the construction schedule, the exact location and duration of activities within each street (i.e., which lanes and access points/driveways would be blocked on which days and for how long), and a toll-free telephone number for receiving questions or complaints.
- Include a plan to coordinate all construction activities with emergency service providers in the area at least one month in advance. Emergency service providers shall be notified of the timing, location, and duration of construction activities. All roads shall remain passable to emergency service vehicles at all times.
- Include the requirement that all open trenches be covered with metal plates at the end of each workday to accommodate traffic and access.
- Specify the street restoration requirements pursuant to PG&E's franchise agreements with the City and County of San Francisco.
- Identify all roadway locations where special construction techniques (e.g., horizontal boring, directional drilling, or night construction) would be used to minimize impacts to traffic flow.
- Develop circulation and detour plans to minimize impacts to local street circulation. This may include the use of signing and flagging to guide vehicles through and/or around the construction zone. These plans will also address loading zones.

APM TR-2: Marine Traffic Management Implementation. PG&E and its contractors will coordinate with the USCG VTS to establish a Vessel Safety Zone, and will provide information for the appropriate notices to mariners for cable laying work. The USCG requires 90-day notification for establishment of the Vessel Safety Zone. This information is then disseminated by the USCG to mariners and other parties.

3.16.4.3 Construction, Operation, and Maintenance Impacts

a) Would the project conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited

to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? ***Less-Than-Significant Impact.***

Construction

Project construction would occur within and/or across a number of roadways, and activities associated with construction would temporarily disrupt existing transportation and circulation in the vicinity. No complete long-term road closures are expected, although one-way traffic controls and short-term road closures will be implemented to allow for certain construction activities and to maintain public safety. Impacts would include direct disruption of traffic operations through lane blockages that would result in a reduction in travel lanes and curb parking or detour routing. Project construction work within and/or across Folsom Street could significantly affect traffic flow and operations at that location. Due to Embarcadero Substation's close proximity to the Transbay Temporary Terminal, transit routes may be affected by the short-term lane closures along Folsom Street. The submarine route chosen for the proposed project alignment avoids the potential for conflict with the arterials and public transit routes that would be affected by alternative routes that are exclusively onshore and underground.

Work areas. The width of the temporary construction work zone required for the proposed project in public roadways would be approximately 25 feet. Open trench construction within paved roadways would be expected to proceed at a rate of up to about 300 linear feet per day. Steel plating will be placed over the trench to maintain vehicular and pedestrian traffic across areas that are not under active construction. A construction corridor width of 25 feet would be used in most places for the construction of the duct bank, but additional space would be required at the vault and boring locations. Equipment and vehicles generally would be parked on the street opposite the trench. Construction zones would occur entirely within the paved portion of City streets; therefore, no sidewalk closures are anticipated. Traffic controls will also be implemented to direct local traffic safely around the work areas. PG&E will apply for a Special Traffic Permit from the City of San Francisco.

Each of the following roadways is parallel to the proposed onshore underground alignment and may experience lane closures during construction of the project:

- Spear Street from its cul-de-sac next to The Embarcadero to Folsom Street
- Folsom Street from Spear Street to 1st Street
- 23rd Street from Illinois Street to the DHL Warehouse gate

In addition, the following roadways are crossed by the proposed project route and may experience lane closures where they intersect the proposed project route:

- Harrison Street
- Main Street
- Beale Street
- Fremont Street

HDD. Special construction techniques (such as horizontal direction drilling, or HDD) are proposed at the northern and southern transition areas from marine to on-shore segments. The HDD construction method will ensure at the northern transition area that vehicle, rail, bicycle, and pedestrian traffic along the Embarcadero will not be disrupted during the project. At both northern and southern transition areas between marine and onshore segments, excavation for bore pits and splice vaults will require a work zone to be closed for approximately six weeks.

The southern submarine/underground transition landing zone will be located approximately 200 feet from shore, near the DHL Warehouse, in an area with no through traffic. The HDD work zone is not anticipated to block access for DHL Warehouse employees or trucks. The northern submarine/ underground transition landing zone will be located on the easternmost block of Spear Street, directly underneath the I-80 Bay Bridge. This block of Spear Street is a cul-de-sac with no through traffic. The location of the northern bore pit was chosen specifically to maintain access for residents and minimize conflicts with residential driveways on the south side of Spear

Street. Approximately 23 metered parking spaces on the south side of Spear Street will be closed during the HDD construction.

Closures due to trenching. Collectively, closures due to trenching are anticipated to last approximately three months, although the duration of lane closures on individual streets would be dictated by the pace of construction (anticipated to be about 300 feet per day). One traffic lane would remain open at all times on Spear Street between the cul-de-sac and Harrison Street, although a flagger may be required to maintain two-way traffic. Spear Street operates one-way southbound between Folsom Street and Harrison Street, so no flagger is required for maintaining two-way operations on that segment. Folsom Street between Spear Street and 1st Street is a two-way roadway, with three travel lanes eastbound and one travel lane westbound. It is unknown at this time which side of Folsom Street (north or south side) will be affected by the temporary closure.

The north side of Folsom Street has one westbound travel lane, and this lane is for exclusive bus use between the Transbay Temporary Terminal and 1st Street. The south side of Folsom Street has on-street parking and a Class II bicycle lane. In addition, a number of transit routes run along Folsom Street between Main Street and 1st Street (with the Transbay Temporary Terminal as a destination), including routes operated by six transit agencies (SF Muni, Golden Gate Transit, AC Transit, SamTrans, WestCAT, and Greyhound). The temporary lane closures and the increased disruption to vehicles, bicyclists, and transit riders as a result of these closures would be a less-than-significant impact and would be further minimized by the implementation of APM TR-1.

Marine traffic. During the construction of the underwater portion of the transmission line, a cable-laying barge positioned by tugboats will be present on the bay along the submarine route. Barges have right-of-way under maritime rules, because of their limited maneuverability. The barge will typically be pulled into position via commercial tugboats, and the barge anchors will be positioned to allow the barge to kedge between them along the cable route. (Kedging is a process by which a ship is moved slowly along the surface of the water towards the fixed point of the anchor.) Once in position, the moored barge will be propelled via two diesel engines – one for steering, the other for kedging anchor.

Since the submarine route is located west of the established north/south shipping lanes used by commercial and naval traffic that travels into and out of the Bay, and designated anchorage areas are located east and southeast of the submarine route, the project would have no effect on these areas.

It is expected that crews will need to board crew boats from an existing commercial marina such as the Yerba Buena Island Marina, and be taken to the designated anchoring locations of other project vessels. Given that anchoring locations vary each day based on local traffic, project vessels and barges will be directed daily regarding anchoring locations via the Vessel Traffic Service of San Francisco and the USCG. No specific anchoring points or locations are known at this time.

The current schedule estimate is for off-shore cable-laying activities to occur during the mid- to late summer and early fall, in the June to November 2015 time period. The actual duration of the cable laying will be relatively short (a day or two for each of the three cables), plus mobilization and demobilization. Cable-laying barge, tug boats, and ancillary boats will be present for a few weeks. Vessels and equipment, including dive boat and divers, will also be present to prepare the HDD exit and when the HDD exits and cable are tied to the HDD head and the cable is pulled back. These activities and vehicle operations will comply with applicable navigational codes and standards, and are very limited in their extent. The operation would be coordinated with VTS, a Vessel Safety Zone established, and movements will be coordinated with and monitored by the VTS. The VTS Notices to Mariners will be used to continuously advise vessel operators of the cable laying operation. Vessels involved in the cable laying will operate according to 72 COLREGS.

San Francisco Giants home games would be scheduled during this period. As outlined in APM TR-2 above, based on discussions with USCG personnel in July 2012, coordination with the USCG will occur to avoid any conflicts with dredging operations in the areas, with the passenger ferry service to/from China Basin, as well as with other marine traffic.

Operation and Maintenance

To facilitate proper equipment operation and safety for the new and existing facilities, current project operation and maintenance activities will continue at Embarcadero Substation and Potrero Switchyard. No impacts due to operation and maintenance activities are anticipated.

b) Would the project conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways? *Less-Than-Significant Impact.*

Construction

Project construction-generated traffic would be temporary and therefore would not result in any long-term degradation in operating conditions or LOS on any proposed project roadways. The primary off-site impacts from the movement of construction trucks would include short-term and intermittent effects on traffic operations due to slower movements and larger turning radii of the trucks compared to passenger vehicles. The majority of the proposed project route is located relatively close to major arterials and freeways.

Traffic-generating construction activities related to the proposed project would consist of the daily arrival and departure of construction workers to each work site; trucks hauling equipment and materials to the work site; and the hauling of excavated spoils from, and import of new fill to, each work site. During construction, the approximate number of construction personnel for each task would be:

- 30 construction personnel for excavation and conduit installation
- 8 truck drivers during conduit installation using two excavation crews
- 20 construction personnel for on-shore cable installation
- 15 construction personnel for the HDD installations
- 25 construction personnel for the submarine cable installation

Based on these estimated crew sizes, construction worker trips traveling to and from each work site are not anticipated to exceed 40 round trips (80 one-way trips) per day.

Construction will typically occur between 7 a.m. and 8 p.m., or during times set by the City and County of San Francisco in the Excavation Permit. If trenching work will cause traffic congestion, the City may require nighttime work to minimize traffic disruption. All applicable City, Port, County, state, and federal regulation, ordinances, and restrictions will be identified and complied with prior to and during construction.

According to the 2011 SFCMP, eastbound Folsom Street between 1st Street and The Embarcadero operates at LOS E during both the AM and PM peak hours. Temporary lane closures along this segment of Folsom Street may cause the roadway to operate at LOS F conditions. Nonetheless, the LOS standards for roadways that are part of the 2011 SFCMP network are intended to regulate long-term traffic increases generated by new developments, and do not apply to temporary construction projects. Accordingly, the proposed project would not generate additional trips that would cause roadways to exceed LOS standards in the 2011 SFCMP. In addition, the affected segment of Folsom Street is defined in the 2011 SFCMP as being within an Infill Opportunity Zone, and is therefore exempt from LOS standards.

Operation and Maintenance

No new staff will be required for maintenance or operations at the new Potrero Switchyard or at Embarcadero Substation; therefore no impacts to traffic will occur.

c) Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? *No Impact.*

No change in air traffic patterns will occur as a result of the project, so there will be no impact. No airports or airport runways are found within 20,000 feet of the project, and therefore Federal Aviation Administration 14 CFR 77 regulations regarding obstructions within that distance would not apply to the project.

d) Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? ***Less-Than-Significant-Impact.***

Construction

Potential short-term impacts associated with temporary lane closures during construction will be less than significant, and will be further reduced with implementation of APM TR-1. The proposed project would not involve any new permanent design features that could be hazardous or incompatible because, upon completion, the cable would be underground. However, heavy equipment operating adjacent to or within a road right-of-way could increase the risk of accidents. Construction-generated trucks on project area roadways would interact with other vehicles. Potential conflicts also could occur between construction traffic and bicyclists and pedestrians.

PG&E would obtain all necessary road encroachment permits prior to construction and would comply with all the applicable conditions of approval. The applicant-prepared Traffic Management Plan (to be prepared in coordination with the City) would govern how project construction would comply with roadside safety protocols, so as to reduce the risk of accidents. With these measures, the impact would be less than significant.

Operations

An entrance to the new Potrero Switchyard will be constructed off 23rd Street. This entrance, constructed in the middle of the block on a straight street with very low traffic, will be used infrequently and does not create a hazard.

e) Would the project result in inadequate emergency access? ***Less-Than-Significant Impact.***

Routes for emergency vehicles will be maintained throughout project construction. The proposed project activities could have the potential, in rare circumstances, to slow emergency response vehicles (for example, a slow-moving delivery truck could occupy momentarily a lane or space needed for emergency vehicle access); this potential impact will be less than significant and will be further minimized with the notifications to emergency service providers and other measures that comprise APM TR-1.

f) Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? ***Less-Than-Significant Impact.***

The Class II bike lane along Folsom Street from 1st Street to Spear Street could be temporarily affected by project construction. Lane closures may temporarily detour bikeways, but impacts would be short-term and temporary. Alternate bike routes are available nearby on Market Street and Townsend Street.

The proposed project would have no lasting impact on demand for alternative transportation or on alternative transportation facilities. Project construction could temporarily disrupt bus access to and from the Transbay Temporary Terminal at Folsom Street between Main Street and Beale Street, when construction occurs in that particular area. Bus routes on streets may need to be temporarily detoured, and bus stops temporarily relocated. Project construction could result in the temporary relocation of the bus stop on the south side of Folsom Street, between Main Street and Beale Street.

Construction zones would occur entirely within the paved portion of City streets; therefore, no sidewalk closures are anticipated.

As specified under APM TR-1, PG&E will obtain all necessary road permits prior to construction and would comply with all the applicable conditions of approval. The applicant-prepared Traffic Management Plan (to be prepared in consultation with the City) would establish methods for minimizing construction effects on transit service and bike facilities.

3.16.5 References

AC Transit. 2012. "Maps & Schedules" website. Online: http://www.actransit.org/maps/.

Blue & Gold Fleet. 2012. S.F. Giants AT&T Park Ferry information. Online: http://www.blueandgoldfleet.com/ferry-services/#278.

California Department of Motor Vehicles. 2012 California Vehicle Code. Online: http://dmv.ca.gov/pubs/vctop/vc/vc.htm.

California Department of Transportation (Caltrans). 2010. *California Manual on Uniform Traffic Control Devices for Street and Highways.* Division of Traffic Operations. January 21.

California Department of Transportation (Caltrans). 2011. Traffic Data Branch. Online: http://traffic-counts.dot.ca.gov/.

California Joint Utility Traffic Control Committee. 2010. *California Joint Utility Traffic Control Manual.*

Golden Gate Bridge Highway & Transportation District. 2012a. Giants Ferry website. Online: http://goldengateferry.org/events/ATTParkSched.php.

Golden Gate Bridge Highway & Transportation District. 2012b. "Golden Gate Transit Current Bus Schedules" website. Online: http://goldengatetransit.org/schedules/current/.

Greyhound. 2012. San Francisco Terminal information. Online: http://www.greyhound.com/en/locations/terminal.aspx?city=893299.

Harbor Safety Commission of the San Francisco Bay Area (HSC). 2011. *Harbor Safety Plan.* Online: http://www.sfmx.org/support/hsc/hscplan.php.

Harbor Safety Commission of the San Francisco Bay Area (HSC). 2012. Harbor Safety Bay Area Maps. Online: http://www.sfmx.org/support/hsc/HSC Bay Area Maps.pdf.

Metropolitan Transportation Commission (MTC). 2009. *Transportation 2035 Plan.*

Metropolitan Transportation Commission (MTC). 2012a. "Schedules & Route Finder" website. Online: http://transit.511.org/accessible/schedules/index.aspx.

Metropolitan Transportation Commission (MTC). 2012b. "Maps & Data" website. Online: http://www.mtc.ca.gov/maps_and_data/GIS/maproom.htm.

National Oceanographic and Atmospheric Administration (NOAA). 2012. Navigation Charts Online Viewer, San Francisco Bay. Online: http://www.charts.noaa.gov/OnLineViewer/18650.shtml.

SamTrans. 2012. "Timetables" website. Online: http://www.samtrans.com/schedulesandmaps/timetables.html.

San Francisco Bay Trail Project. 2010. Bay Trail Maps. Online: http://baytrail.abag.ca.gov/maps.html.

San Francisco Bicycle Coalition. 2012. "Maps and Reference" website. Online: http://www.sfbike.org/?maps.

San Francisco County Transportation Authority (SFCTA). 2011. *2011 San Francisco Congestion Management Program*. Online: http://www.sfcta.org/images/stories/Planning/CongestionManagementPlan/2011/Final%202011%20CMP.pdf. December.

San Francisco County Transportation Authority (SFCTA). 2012. "Transbay Transit Center and Caltrain Downtown Extension" website. Online: http://www.sfcta.org/content/view/272/91.

San Francisco Municipal Transportation Agency (SFMTA). 2009. *San Francisco Bicycle Plan*. Online: http://www.sfmta.com/cms/bproj/bikeplan.htm.

San Francisco Municipal Transportation Agency (SFMTA). 2011. Traffic Counts on "Traffic-Related Reports" website. Online: http://www.sfmta.com/cms/rtraffic/trafficrelatedindx.htm.

San Francisco Planning Department. 2005. Rincon Hill Area Plan. Online: http://www.sf-planning.org/ftp/General_Plan/Rincon_Hill.htm.

San Francisco Planning Department. 2010a. San Francisco General Plan Transportation Element. Online: http://www.sf-planning.org/ftp/General_Plan/I4_Transportation.htm.

San Francisco Planning Department. 2010b. "Better Streets Overview" website. Online: http://www.sfbetterstreets.org/why-better-streets/.

San Francisco Redevelopment Agency. 2005. *Redevelopment Plan for the Transbay Redevelopment Project Area*. Online: http://www.sfredevelopment.org/ftp/uploadedfiles/Projects/TB%20Redevelopment%20Plan%282%29.pdf. Adopted June 21.

Transbay Joint Powers Authority. 2012. "Transbay Temporary Terminal" website. Online: http://temporaryterminal.org/find-your-bus-line/.

Transportation Research Board. 1985. Highway Capacity Manual.

Transportation Research Board. 2000. Highway Capacity Manual.

Vallejo Baylink. 2012. "San Francisco Giants Games - Vallejo Baylink Ferry Service" website. Online: http://www.baylinkferry.com/leisure/sf-giants.php?ref=ts.

U.S. Coast Guard (USCG). 2005. *VTS User's Manual.* 28 pp.

U.S. Coast Guard (USCG). Vessel Traffic Service Sector San Francisco. Online: http://www.uscg.mil/d11/vtssf/

Water Emergency Transportation Authority (WETA). 2012. "About Us" web page. Online: http://www.watertransit.org/aboutUs/aboutUs.aspx.

Western Contra Costa Transit Authority (WestCAT). 2012. "Welcome to Lynx" web page. Online: http://www.westcat.org/lynx/.

3.17 Utilities and Service Systems

3.17.1 Introduction

This section describes existing conditions and potential impacts on utilities and service systems as a result of construction, operation, and maintenance of the project, and concludes there will be no impacts in these areas. Under CEQA, utilities and service systems include water, wastewater, and solid waste collection and treatment. This section also addresses potential impacts to power, natural gas, and communications systems.

The proposed project's potential effects on utilities were evaluated to determine their level of significance as provided under the CEQA Guidelines. The significance criteria, as set forth in CEQA Guidelines Appendix G, are summarized in Table 3.17-1. As discussed in more detail below, because there are no potential effects on utilities, no Applicant-Proposed Measures are proposed, and no mitigation is required.

TABLE 3.17-1
CEQA Checklist for Utilities and Service Systems
Embarcadero-Potrero 230 kV Transmission Project

XVII. UTILITIES AND SERVICE SYSTEMS **Would the project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less-than-Significant Impact**	**No Impact**
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☑
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☑
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☑
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☑
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☑
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☑

3.17.2 Regulatory Background and Methodology

3.17.2.1 Regulatory Background

The CPUC has primary jurisdiction over the project by virtue of its exclusive discretionary approval authority over construction, operation, and maintenance of public utility facilities. Because local governments do not have discretionary authority over this type of utility project, such projects are exempt from local ordinances. The following analysis of local regulations relating to solid waste recycling is provided for informational purposes and to assist with CEQA review.

Federal or Federal Delegation

There are no federal regulations that pertain to addressing project impacts to local utilities.

State or State Delegation

California Government Code. Title 1, Division 5, Chapter 3.1, Article 2, 4216 of the California Government Code protects underground structures during excavation. Under this law, excavators are required to contact a regional notification center at least two days prior to excavation of any subsurface installations. In the project area Underground Service Alert (USA) is the regional notification center. USA notifies utility providers with buried lines within 1,000 feet of the excavation, and those providers are required to mark the specific location of their facilities prior to excavation. The code also requires excavators to probe and expose underground facilities by hand prior to using power equipment.

Local

San Francisco Public Works Code. The City of San Francisco includes discharge limitations for discharges to their combined sewer discharge system. San Francisco Public Works Code, Article 4.1 establishes discharge limitations for industrial wastewater discharges to the combined sewer system and requires a permit for discharge. City and County of San Francisco Department of Public Works Order No. 158170 Specifies discharge limitations for discharge to the combined sewer system in addition to those specified in Article 4.1.

San Francisco Construction and Demolition Waste Ordinance. In 2006, the City adopted Ordinance No. 27-06 mandating the recycling of construction and demolition debris (City and County of San Francisco, 2006). Construction and demolition materials must be source-separated at the construction site or transported to a registered facility that can process mixed construction and demolition debris and divert a minimum of 65 percent of the material from landfills.

San Francisco Mandatory Recycling and Composting Ordinance. In 2009 the City adopted the Mandatory Recycling and Composting Ordinance (No. 100-09) requiring recycling separate bins for recyclables, compostables, and trash (City and County of San Francisco, 2009).

San Francisco Green Building Requirements. The City's Green Building Requirements include the following:

> *13C.4.410.2 Solid waste: Areas provided for recycling, composting and trash storage, collection and loading, including any chute systems, must be designed for equal convenience for all users to separate those three material streams, and must provide space to accommodate a sufficient quantity and type of containers to be compatible with current methods of collection* (City and County of San Francisco, 2010).

3.17.2.2 Methodology

In preparing this section, reviews were conducted of the San Francisco General Plan as well as websites and various documents of the San Francisco Public Utilities Commission (SFPUC), Port of San Francisco, Recology, and Waste Management.

3.17.3 Existing Conditions

3.17.3.1 Environmental Setting

The proposed project is located within the highly urbanized City and County of San Francisco and in San Francisco Bay. There are a number of utilities both underground and overhead in the project area. Underground utilities that may be encountered include buried water lines, combined storm drains/sanitary sewers, telephone, cable, fiber optic cable, natural gas, electric traffic loops, and electrical distribution lines. The marine portion of the project will also be installed parallel to the Trans Bay Cable; no other utilities were identified during preliminary engineering in the submarine portion of the project. Overhead utilities include telephone, cable, and electrical distribution and transmission lines. Utility services and providers are shown in Table 3.17-2.

Stormwater and Wastewater Services

The SFPUC is a department of the City and County of San Francisco that provides drinking water, stormwater, and wastewater services to San Francisco. Stormwater services are provided to most of San Francisco by the

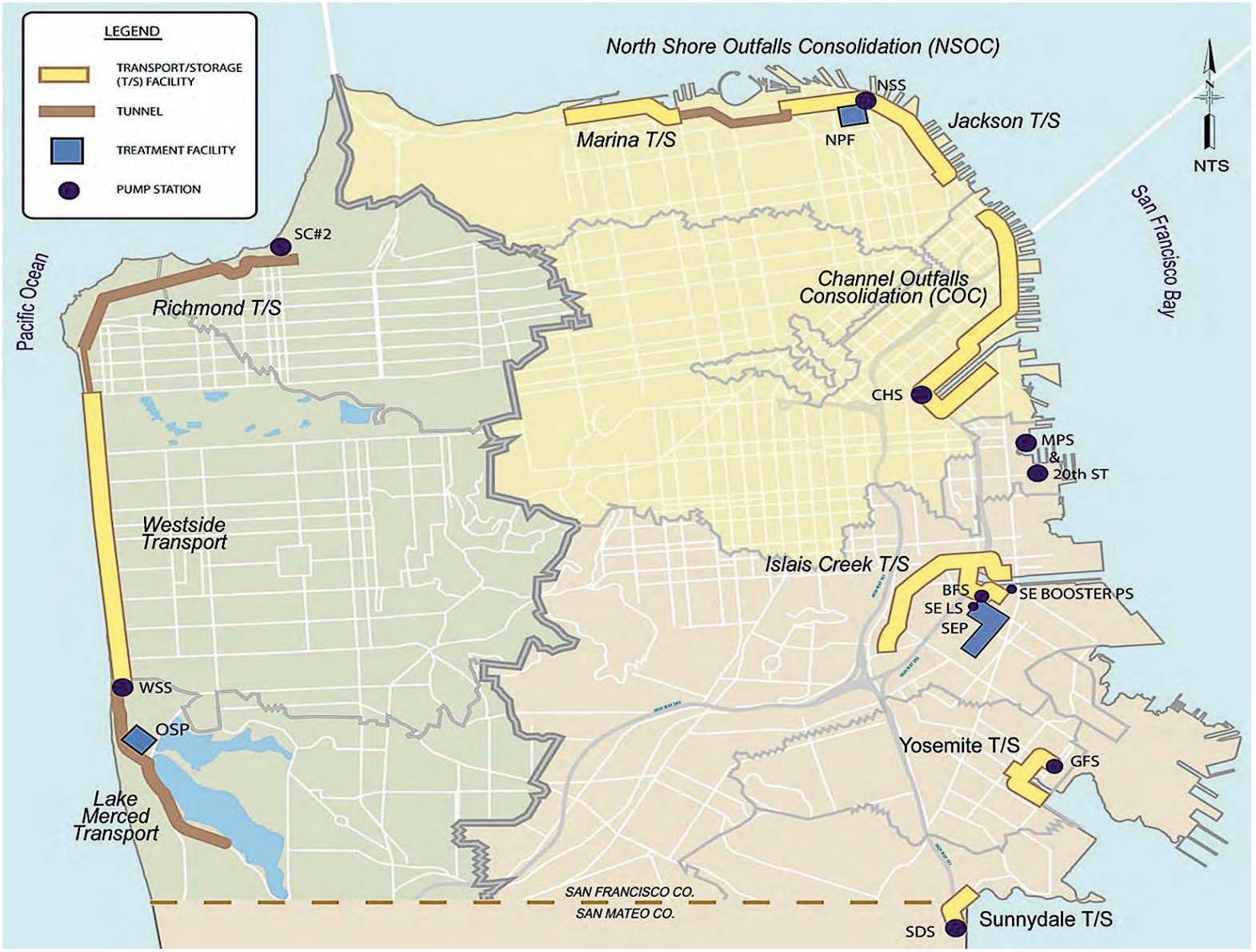
Wastewater Enterprise, a branch of the SFPUC. Most of the stormwater in the City and County of San Francisco is collected in the San Francisco Combined Sewer System, a combined storm water and sanitary sewer system; water is treated prior to discharge to San Francisco Bay or the Pacific Ocean. The Wastewater Enterprise operates and maintains 993 miles of combined sewers, and operates storage facilities and three treatment plants. The City of San Francisco recently completed a Sewer System Master Plan that assesses the current situation and provides a framework for future actions (SFPUC, 2010b). The Master Plan envisions retaining the existing combined storm and wastewater sewer system.

TABLE 3.17-2
Local Utility and Service Providers
Embarcadero-Potrero 230 kV Transmission Project

Utility or Service	Provider
Water Service	San Francisco Public Utilities Commission
Sewer and Storm Water Service	San Francisco Public Utilities Commission Port of San Francisco
Water Line Maintenance	San Francisco Water Department
Wastewater Collection and Treatment at the Southeast Water Pollution Control Plant	San Francisco Public Utilities Commission San Francisco Bureau of Street and Sewer Repair
Garbage Services	Recology - Golden Gate Disposal Recology - Sunset Scavenger
Landfills	Waste Management - Altamont Landfill until 2015 Recology – Recology Ostrom Road after 2015
Natural Gas and Electric Service	San Francisco Public Utilities Commission PG&E Transbay Cable – City of Pittsburg

Large underground transport /storage boxes (shown in yellow on Figure 3.17-1) capture, store, and provide initial treatment for stormwater around the City. The boxes are 40 feet square, and are buried at a depth of 10 feet below ground surface, resulting in the bottom of the facility located at an estimated total depth of 50 feet below ground surface. These massive storage tanks or tunnels catch combined stormwater and sewage and have a total storage capacity of about 200 million gallons. In the event that a prolonged storm event exceeds storage capacity, the wastewater is discharged to San Francisco Bay through one of 36 discharge points. These overflow discharges occur approximately ten times per year (SFPUC, 2012). One of the storage/transport boxes underlies The Embarcadero where the project's north end will cross as an HDD.

About ten percent of the City's storm runoff does not flow into the City's combined system. These areas are served either by the Municipal Separate Storm Sewer Systems (the MS4 areas) or the Port of San Francisco (SFPUC, 2010a). The Port of San Francisco operates a separate storm sewer system under an independent Stormwater Management Program developed in 2003. The piers along the Embarcadero and portions of Pier 70 are served by the Port of San Francisco. Parcels adjacent to 22nd and 23rd Streets, east of the Port's property line on Illinois Street, are discharged to the City's combined system (Port of San Francisco, 2003).



Source: SFPUC, Technical Memorandum No. 501, Collection System Modeling, 2010.

FIGURE 3.17-1
Existing Combined Sewer Outflows in San Francisco
Embarcadero-Potrero 230 kV Transmission Project
San Francisco, CA

Wastewater Treatment

The SFPUC operates three wastewater treatment plants in the City. They are:

- The Oceanside Water Pollution Control Plant (WPCP) is located at 3500 Great Highway. It provides secondary treatment to an average dry weather flow of about 17.5 million gallons per day (mgd). It has a maximum treatment capacity of 65 mgd. Treated effluent is discharged 4.5 miles into the Pacific Ocean (SFPUC, 2012).
- The Southeast WPCP is located at 750 Phelps Street. On average it provides secondary treatment for 63 mgd during dry weather, and is designed for an average of 85.4 mgd (SFPUC, 2010c). Treated effluent is discharged 800 feet into San Francisco Bay.
- The North Point Facility is located at 111 Bay Street and operates only when it rains. This facility provides pretreatment and primary-level treatment of wastewater collected in the north part of the City during storm events and can treat 150 mgd. Treated effluent is discharged 800 feet into San Francisco Bay (SFPUC, 2012).

Storm and wastewater from the project area is collected and discharges to the Southeast WPCP, or to the Bay, as described above under overflow conditions.

Water Supply and Conveyance

SFPUC's regional water system consists of three integrated water supply and conveyance systems: the Hetch Hetchy, Alameda, and Peninsula systems. The SFPUC provides potable water to 2.5 million customers in the Bay Area. Approximately one third of their water is delivered to San Francisco through a gravity flow system. The Hetch Hetchy Reservoir on the Tuolumne River produces about 85 percent of the water in the Hetch Hetchy system and can store up to 117 billion gallons. The remaining 15 percent is collected by six reservoirs in the Alameda and Peninsula watersheds (SFPUC, 2012).

The SFPUC currently has one recycled water program in operation, and is planning three others. The SFPUC assisted the North San Mateo County Sanitation District in upgrading their treatment plant to produce tertiary-level recycled water. This is currently used to irrigate three golf courses, two of which are located partially in San Francisco.

Solid Waste Disposal

The City and County of San Francisco does not operate solid waste hauling operations. Solid waste hauling and disposal within the project area is conducted by Recology. Recology provides recycle, compost, and garbage collection services and operates recycling facilities in the City. Waste is collected through drop boxes and curbside collection. The San Francisco Board of Supervisors has mandated a goal of 75 percent waste diversion for all of San Francisco by the year 2010 and zero waste by 2020. Currently 78 percent of San Francisco's waste is diverted from the landfill (Recology, 2012a). Waste is hauled to the San Francisco Dump, the local transfer station at 501 Tunnel Road.

An estimated 6,300 cubic yards of excavated material from the trench and vault locations will be hauled off-site for disposal to an appropriately licensed facility or hauled to a commercial soil recycling facility. Small amounts of additional food-related trash, packing material, and other miscellaneous trash from construction would also be hauled on a regular basis from construction sites.

There are no active solid waste disposal facilities within the County. Waste is hauled from the San Francisco Dump to Altamont Landfill, which has disposal capacity through the year 2045. San Francisco currently has a contract with Altamont Landfill that is set to expire in 2015. Altamont Landfill is located at 10841 Altamont Pass Road, Livermore, California (Waste Management, 2012). After 2015, waste will be landfilled in Recology Ostrom Road, a landfill owned by Recology located in Wheatland, Yuba County. Recology Ostrom Road has a total design capacity of over 41 million cubic yards, has an expected closure date of 2066 and can accept up to 3,000 tons of municipal solid waste per day (Recology, 2012b).

Additional regional sanitary landfills include Ox Mountain Landfill in Half Moon Bay; BFI's Newby Island Landfill; Kirby Canyon Landfill in San Jose, Guadalupe Landfill in San Jose, and West Contra Costa Sanitary Landfill in Richmond.

Electricity, Gas, and Other Utilities, and Public Services

The project will include 0.7 mile of underground cable from the landing points for the submarine cable to the substations. Portions of these underground cables will be installed in streets that contain various other utility lines, water, and sewer lines. PG&E's engineering team has taken into consideration the location of other underground utilities in defining feasible routes for the underground portion of the project. Additional utilities identification will occur in final design stages. Prior to trenching, PG&E will notify other utility companies (via Underground Service Alert) to locate and mark existing underground structures along the proposed alignments. In addition, PG&E will probe and expose existing utilities by hand before using power equipment. These actions will prevent impacts to existing utilities. PG&E has conducted existing utilities surveys as part of its feasibility study and routing analysis. Based on these surveys and during detailed design, PG&E will design the project to have no permanent impact on power, natural gas, communications systems, or any other utilities that are specifically documented.

Also during detailed design, PG&E will assess whether the temporary interruption of other utilities will be necessary. If they are, then PG&E will obtain timely approval from other utilities and closely coordinate with them until those utilities are returned to service. Prior to construction, PG&E will also have developed a database of emergency contacts for utilities that may be in close proximity or require monitoring during construction of the project. In case of accidental service interruption to another utility, PG&E would use this database to immediately coordinate actions to restore service in a safe and timely manner.

3.17.4 Applicant-Proposed Measures and Potential Impacts

3.17.4.1 Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, and as summarized in Table 3.17-1, impacts to utilities may be considered significant if the Project would:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects
- Have insufficient water supplies available to serve the project from existing entitlements and resources, or require new or expanded entitlements
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments
- Not be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs
- Not comply with federal, state, and local statutes and regulations related to solid waste

3.17.4.2 Applicant-Proposed Measure

APM Utilities and Service Systems (UTIL)-1: Coordination with SFPUC Regarding Stormwater System Facilities. One of the extremely large SFPUC stormwater transport/storage boxes underlies The Embarcadero, where the northern HDD is planned. In this area, the HDD depth will be coordinated with SFPUC, in order to prevent damaging the storage box.

3.17.4.3 Impacts

a) Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? *No Impact.*

The project area will be served by the Southeast Water Pollution Control Plant via the combined storm and sanitary sewer system. The minimal amount of effluent generated by construction workers will not cause the wastewater treatment plant to exceed its treatment capacity.

PG&E will apply for a National Pollutant Discharge Elimination System General Construction Stormwater Permit for discharges of stormwater associated with Small Linear Underground/Overhead Construction Projects (General Permit) from the State Water Resources Control Board. Groundwater encountered during trenching will be pumped into containment vessels (Baker tanks), tested for turbidity and pH, and discharged to the City's combined sewer system, unless the analysis shows that the water's pH and TDS exceeds the City's discharge criteria. In this case the water would be trucked to an appropriate disposal facility. Temporary approvals for water use and discharge will be obtained, as required by the construction contractor, and water disposed of in accordance with state and federal standards. The project will not discharge trench water to the combined system during significant rainfall events. Wastewater treatment requirements of the RWQCB will not be exceeded; therefore, no impacts will result. For detailed information on potential impacts to groundwater, see Section 3-9, Hydrology and Water Quality.

b) Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? *No Impact.*

The project will not require the construction of new, or expansion of existing, water treatment facilities; existing supplies are sufficient to provide water for dust control. Wastewater service will be provided by portable toilets, and waste disposal will occur at appropriately licensed facilities offsite. The minimal amount of effluent generated by construction workers will not cause a wastewater treatment plant to exceed its treatment capacity. Trench water will be disposed of as describe above to the combined system or hauled offsite to an appropriate disposal facility. Once operational, Potrero Switchyard will not require a potable water source or a connection to the sewer system. Therefore, no impacts will occur to water or wastewater treatment facilities resulting in the need for new or expanded facilities.

c) Would the project require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? *No Impact.*

The project does not include construction of new stormwater drainage facilities, nor will it result in new or expanded stormwater drainage facilities. However, as noted above, one of the extremely large SFPUC stormwater transport/storage boxes underlies The Embarcadero, where the northern HDD is planned. Implementation of APM UTIL-1 will ensure that the project is designed to avoid impacts to the box.

d) Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? *No Impact.*

The primary need for water will be construction-related dust control activities. Water will be trucked in as needed. Recycled water will be used if feasible. Water for the HDD operations would likely be taken from a city hydrant under a permit with the City. As discussed previously in this section, SFPUC's regional water system consists of three integrated water supply and conveyance systems: the Hetch Hetchy, Alameda, and Peninsula systems. The SFPUC provides potable water to 2.5 million customers in the Bay Area. Approximately one third of their water is delivered to San Francisco through a gravity flow system. The Hetch Hetchy Reservoir on the Tuolumne River produces about 85 percent of the water in the Hetch Hetchy system and can store up to 117 billion gallons. The remaining 15 percent is collected by six reservoirs in the Alameda and Peninsula watersheds (SFPUC, 2012).

The minimal water needed for dust control and construction crew consumption will not exceed available supplies. Water trucks used for dust control during construction generally have capacity for 3,000 gallons of water. Sufficient existing water supplies are available; therefore, no impact will occur.

e) Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? *No Impact.*

The project will require portable toilets for construction workers. Sanitary waste will be disposed of at appropriately licensed facilities with adequate capacity. Trench water will be disposed of as described above to the combined SFPUC system or hauled offsite to an appropriate disposal facility. Licensed facilities in the area have adequate capacity; therefore, no impact will occur.

f) Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs? *No Impact.*

An estimated 6,300 cy of excavated material from the trench and vault locations will be offhauled for disposal to an appropriately licensed facility or hauled to a commercial soil recycling facility. Small amounts of additional food-related trash, packing material, and other miscellaneous trash from construction would also be hauled on a regular basis from construction sites. Existing landfills serving the project area have adequate capacity for this amount of construction debris and soils; therefore, no impact will occur. Disposal of hazardous materials is addressed in Section 3.8, Hazards.

g) Would the project comply with federal, state, and local statutes and regulations related to solid waste? *No Impact.*

PG&E will manage solid waste generated during construction and operation of the project by off-hauling to appropriate landfills as described above, and using its existing recycling programs for underground construction in San Francisco and operation of the existing Potrero Switchyard and Embarcadero Substation. PG&E and the project will comply with all applicable federal, state, and local statutes and regulations related to solid waste.

3.17.5 References

City and County of San Francisco. 2006. Ordinance No. 27-06. Online: http://www.sfenvironment.org/article/construction-amp-demolition/construction-and-demolition-resources. Accessed July 31, 2011.

City and County of San Francisco. 2009. Ordinance No. 100-09. Online: http://www.sfenvironment.org/policy/mandatory-recycling-composting-ordinance. Accessed July 31, 2011.

City and County of San Francisco. 2010. Building Code Chapter 13C Green Building Requirements. Online: http://www.amlegal.com/nxt/gateway.dll/California/sfbuilding/buildingcode2010edition/chapter13cgreenbuildingrequirements?f=templates$fn=default.htm$3.0. Accessed July 31, 2012.

Port of San Francisco. 2003. *Storm Water Management Plan 2003-2004.* December.

Recology. 2012a. Recology website. Online: http://sunsetscavenger.com/index.php. Accessed May 15, 2012.

Recology. 2012b. Recology Ostrom Road website. Online: http://www.recologyostromroad.com/. Accessed May 15, 2012.

San Francisco Chronicle. 2011. "*S.F. moves closer to Yuba County landfill pact*." Article by Rachel Gordon. Online: http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2011/07/20/BAJP1KD5NI.DTL. July 21, 2011. Accessed May 15, 2012.

San Francisco Public Utilities Commission (SFPUC). 2009. *City and County of San Francisco 2030 Sewer System Master Plan. Technical Memorandum No. 606.* 100 pp.

San Francisco Public Utilities Commission (SFPUC). 2010a. *San Francisco's Phase II General Permit for Stormwater Discharges, 2009 Annual Report.* March 30.

San Francisco Public Utilities Commission (SFPUC). 2010b. *San Francisco Sewer System Master Plan Summary Report Final Draft.* Online: http://www.sfwater.org/index.aspx?page=311. Accessed July 7, 2012.

San Francisco Public Utilities Commission (SFPUC). 2010c. *San Francisco Sewer System Master Plan. Draft.* Chapter 3, Wastewater Facilities Operation and Performance. Online: http://www.sfwater.org/modules/showdocument.aspx?documentid=723. June 15, 2010. Accessed May 16, 2012.

San Francisco Public Utilities Commission (SFPUC). 2012. "San Francisco Water Power Sewer" website. Online: http://sfwater.org/. Accessed May 15, 2012.

Waste Management. 2012. "Waste Management—Bay Area" website. Online: http://wmcabay.wm.com/landfills/altamont.htm. Accessed May 15, 2012.