DRAFT
Mitigated Negative Declaration and Supporting Initial Study

for Pacific Gas and Electric Company's

Embarcadero-Potrero 230 kV Transmission Project

(A.12-12-004)

Lead Agency:

California Public Utilities Commission

Prepared by:

Aspen Environmental Group

August 2013

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

TO: All Interested Parties

Pursuant to the California Public Utilities Commission's (CPUC) General Order 131-D, Pacific Gas and Electric Company (PG&E) has filed an application with the CPUC for a Certificate of Public Convenience and Necessity for the Embarcadero-Potrero 230 Kilovolt (kV) Transmission Project (Application No. A.12-12-004).

Project Background PG&E is proposing to construct the Embarcadero-Potrero Project to improve transmission system reliability to downtown San Francisco, California. The project consists of constructing a new 3.5-mile 230 kV transmission line entirely within the City and County of San Francisco from Embarcadero Substation near the corner of Fremont and Folsom Streets, to Potrero Switchyard on Illinois Street between 22nd and 23rd Streets. Approximately 2.5 miles would be installed offshore underneath the seafloor of the San Francisco Bay, 0.4 mile would be installed using horizontal directional drills between onshore transition points and the bay, and approximately 0.6 mile would be installed underground in paved areas, including Spear Street and Folsom Street in San Francisco's Rincon Hill neighborhood. Construction of a new 230 kV switchyard would occur near the existing Potrero Switchyard, but no new substation work is proposed to occur at the existing Embarcadero Substation beyond the proposed termination of the new cable into the 230 kV bus.

Depending on CPUC approval, construction is targeted to start in February 2014 following permitting and right-of-way acquisition and is estimated to be complete in December 2015.

Information Available: The CPUC Energy Division has prepared a Mitigated Negative Declaration and supporting Initial Study (IS/MND) describing the project and its potential environmental effects. Based on this document, it has been determined that the proposed project, as modified, will not have any significant effects on the environment. The CPUC's environmental document may be reviewed at the following locations:

CPUC Energy Division
505 Van Ness Avenue, 4th Floor
San Francisco, CA 94102

San Francisco Main Library
100 Larkin Street
San Francisco, CA 94102

Potrero Branch Library
1616 20th Street
San Francisco, CA 94107

PG&E Resource Center: The Pacific Energy Center
851 Howard Street
San Francisco, CA 94103

For electronic access to the MND and other project information/reports, check the CPUC's website at:

http://www.cpuc.ca.gov/Environment/info/aspen/embarc-potrero/embarc-potrero.htm

Public Informational Meeting: In order to help affected communities understand the Proposed Project and the Proposed IS/MND and to explain how the public can participate in the CPUC's decision-making processes, the CPUC will hold an informational workshop on Tuesday, August 20, 2013. This informal workshop is an opportunity to ask questions about the content of the Draft IS/MND. While written comments may be submitted during the workshop, there will be no facilities to record oral comments.

August 20, 2013 from 3:00 p.m. to 5:00 p.m. at Port of San Francisco, Bayside 1 Conference Room
Pier 1, Washington Street at The Embarcadero; San Francisco, California

Time for Review: This IS/MND will undergo a public review period from August 15 through September 16, 2013. Comments must be received in writing by 5:00 p.m. on September 16, 2013, at the following address:

Billie Blanchard
California Public Utilities Commission
c/o Aspen Environmental Group
235 Montgomery Street, Suite 935
San Francisco, CA 94104-3002
embarcaderopotrero@aspeneg.com

DRAFT

Mitigated Negative Declaration and Supporting Initial Study

for

Pacific Gas and Electric Company's Embarcadero-Potrero 230 kV Transmission Project

(A.12-12-004)

Lead Agency:

California Public Utilities Commission, Energy Division
505 Van Ness Avenue, 4th Floor
San Francisco, California 94102

Prepared by:

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August 2013

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STATE OF CALIFORNIA Edmund G. Brown Jr., Governor

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
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DRAFT

Mitigated Negative Declaration

Pacific Gas & Electric Company's Embarcadero-Potrero 230 kV Transmission Project

Application No. A.12-12-004

Lead Agency: California Public Utilities Commission
Energy Division
505 Van Ness Avenue, 4th Floor
San Francisco, California 94102

Contact: Billie Blanchard, Project Manager
(415) 703-2068 or billie.blanchard@cpuc.ca.gov

1. Mitigated Negative Declaration

1.1 Project Information

Project: Embarcadero-Potrero 230 kV Transmission Project
San Francisco, California

Project Sponsor: Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, California 94105
(800) 743-5000

1.2 Introduction

Pursuant to California Public Utilities Commission's (CPUC) General Order 131-D, Pacific Gas and Electric Company (PG&E), a regulated California utility, filed an application and Proponent's Environmental Assessment (PEA) on December 11, 2012 (Application No. A.12-12-004), for a Certificate of Public Convenience and Necessity (CPCN) to authorize construction of the Embarcadero-Potrero 230 kilovolt (kV) Transmission Project (Proposed Project). The CPUC Energy Division deemed the PEA and Application complete on January 10, 2013.

Pursuant to CEQA, the CPUC must prepare an Initial Study (IS) for the Proposed Project to determine if any significant adverse effects on the environment would result from project implementation. The IS utilizes the significance criteria outlined in Appendix G of the CEQA *Guidelines*. If the IS for the project indicates that a significant adverse impact could occur, the CPUC would be required to prepare an Environmental Impact Report (EIR).

According to Article 6 (Negative Declaration Process) and Section 15070 (Decision to Prepare a Negative Declaration or Mitigated Negative Declaration) of the CEQA *Guidelines*, a public agency shall prepare or have prepared a proposed negative declaration or mitigated negative declaration for a project subject to CEQA when:

(a) The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or

(b) The initial study identifies potentially significant effects, but:

(1) Revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and

(2) There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.

Based on the analysis in the Initial Study, it has been determined that all project-related environmental impacts could be reduced to a less than significant level with the incorporation of feasible mitigation measures. Therefore, adoption of a Mitigated Negative Declaration (MND) will satisfy the requirements of CEQA. The mitigation measures included in this MND are designed to reduce or eliminate the potentially significant environmental impacts described in the Initial Study. Where a measure described in this document has been previously incorporated into the project, either as a specific project design feature or as an Applicant Proposed Measure, this is noted in the discussion. Mitigation measures are structured in accordance with the criteria in Sections 15126.4 and 15370 of the CEQA *Guidelines*.

1.3 Project Description

The proposed Embarcadero-Potrero 230 kV Transmission Project would include construction, operation, and maintenance of a new 230 kV transmission line entirely within the City and County of San Francisco from the Embarcadero Substation at the corner of Fremont and Folsom Streets, to the Potrero Switchyard on Illinois Street between 22nd and 23rd Streets.

The new 230 kV transmission line would be approximately 3.5 miles in total length, including approximately 2.5 miles to be installed offshore in the San Francisco Bay, 0.4 miles to be installed in horizontal directional drills (HDD) between onshore transition points and the bay, and approximately 0.6 miles to be installed underground in paved areas, including Spear Street and Folsom Street in San Francisco's Rincon Hill neighborhood. Construction of a new 230 kV switchyard would occur near the existing Potrero Switchyard, but no new substation work is proposed to occur at the existing Embarcadero Substation beyond the proposed termination of the new cable into the 230 kV bus.

PG&E's project objectives include improving the reliability of the existing transmission system in San Francisco to provide a high likelihood of continued electric service to downtown San Francisco in the event of overlapping outages on both of two existing 230 kV transmission lines that presently feed Embarcadero Substation.

1.4 PG&E PEA Alternatives Considered

CEQA does not require the inclusion of an alternatives analysis in a Mitigated Negative Declaration because the Initial Study concludes that, with incorporation of mitigation measures, there would be no significant adverse impacts resulting from the Proposed Project (CEQA Guidelines Sections 15063(d) and 15071). However, PG&E was required to provide an alternative analysis in its PEA that was submitted as part of its CPCN application (A.12-12-004) for the Proposed Project.

Although no alternatives analysis is required to be provided in this document, this section summarizes the process that PG&E used to develop its Proposed Project, because this process involved evaluation of several options that could meet the project objectives. As described in the PEA, PG&E initially screened 10 potential routes, three possible transition locations for the cables at each end of the route, and three switchyard locations before narrowing the options to the following, which were further evaluated in a feasibility study (PG&E, 2012a; B&V, 2012):

- Three switchyard site location alternatives, including the proposed site immediately east of the existing Potrero Switchyard
- Two onshore alternative transmission line routes
- Proposed submarine route (Proposed Project)
- No Project Alternative

In accordance with Section IX (A)(1)(a) of CPUC General Order 131-D, PG&E provided a discussion and an evaluation of the advantages and disadvantages of each of these alternatives in the PEA, as well as a brief description of the criteria for choosing the proposed route and switchyard location. The PEA determined that the Proposed Project would have considerably less impact on urbanized areas than either of the alternative onshore routes given that it has only 0.6 mile of underground construction, and therefore, would have the least impact on urbanized residential and commercial areas, including the least construction impacts to land uses, traffic, transportation, noise, and air quality. PG&E also concluded in the PEA that the proposed route would be the most reliable seismically of the three route alternatives and would best meet the project purpose and need. PG&E selected the proposed switchyard site due to engineering feasibility and ease of connectivity to existing facilities (PG&E, 2012a). PG&E's PEA section that addresses alternatives is available at the following website:

http://www.cpuc.ca.gov/Environment/info/aspen/embarc-potrero/pea/5-Alternatives.pdf

1.5 CAISO San Francisco Peninsula Reliability Assessment

The San Francisco-Peninsula transmission system is in the center of PG&E's service territory, serving urban load centers across a unique geographic landscape. The California Independent System Operator (CAISO) considered the Proposed Project during 2011 and 2012, and during other transmission planning cycles the CAISO has or will consider other San Francisco-area proposals. On March 23, 2012, the CAISO Governing Board found the Proposed Project to be needed for reliability, as shown in its 2011-2012 Transmission Plan (pp. 107-108 of CAISO, 2012).

Since then, the CAISO 2012-2013 Transmission Plan initiated a study of the potential need for transmission reinforcement of the San Francisco Peninsula as being particularly vulnerable to lengthy outages in the event of extreme contingencies (i.e., seismic, third-party action, and/or co-located facility failure). CAISO is in the process of conducting the San Francisco Peninsula Extreme Event Reliability Assessment to determine the need and urgency for reinforcement and is engaging stakeholders in the evaluation of risks and potential alternatives. The purpose of the CAISO study is to:

- identify the system performance after extreme events;
- identify the risk and impacts of extreme events in the San Francisco Peninsula area; and
- based upon the system performance, risks and impacts, identify potential alternatives to mitigate for the extreme events. (CAISO, 2013)

The CAISO conducted a detailed assessment and held a stakeholder meeting on May 29, 2013, soliciting comments from stakeholders by June 19, 2013. Based on the assessment, the following mitigation alternatives are going to be considered by the CAISO in developing the mitigation plan for the extreme event in the peninsula area (CAISO, 2013):

- No mitigation (not acceptable based upon the CAISO's assessment)
- Expanded mobile and spare equipment contingency plans and strategy
- Modifications or upgrades to 230 kV system
- Upgrades to 115 kV system
- New 230 kV supply into North Peninsula area:
  - Moraga
  - Pittsburg
  - East Shore
  - San Mateo

Depending upon the results, additional transmission upgrades may be brought to the CAISO Board of Governors as early as September 2013.

Due to the sensitive nature of the material, the reliability assessment and presentations from the stakeholder meeting are being handled on a confidential basis. However, in compliance with FERC Order 890, the CAISO provides stakeholders access to confidential information used in the transmission planning process through a secured website. Information on how to join the stakeholder process and access the secured transmission planning webpage can be found at:

http://www.caiso.com/Documents/2012-2013_TransmissionPlanningProcessAdditionalStudyAssessmentMaterialsAvailableJun6_2013.htm.

1.6 Environmental Determination

The Initial Study was prepared to identify the potential environmental effects resulting from Proposed Project implementation, and to evaluate the level of significance of these effects. The Initial Study relies on information in PG&E's PEA filed on December 11, 2012 (Application No. A.12-12-004), project site reconnaissance by the CPUC environmental team between January and March 2013, CPUC data requests, and other environmental analyses.

PG&E's PEA identified measures to address potentially significant environmental impacts — the Applicant Proposed Measures (APMs) — and these APMs are considered to be part of the description of the Proposed Project. Based on the Initial Study analysis, additional mitigation measures are identified for adoption to ensure that impacts of the Proposed Project would be less than significant. The additional mitigation measures either supplement, or supersede the APMs. PG&E has agreed to implement all of the additional recommended mitigation measures as part of the Proposed Project.

Implementation of the mitigation measures listed here and presented fully in the Initial Study would avoid potentially significant impacts identified or reduce them to less than significant levels.

Mitigation Measure for Construction-Phase Air Quality

MM A-1 **Achieve minimum emission standards.** This measure incorporates and supplements portions of APM AQ-2, Minimize Construction Exhaust Emissions. PG&E shall maintain all construction equipment properly in accordance with manufacturer's specifications, and ensure that equipment is checked by a certified visible emissions evaluator. All off-road construction diesel engines not registered under the CARB Statewide Portable Equipment Registration Program shall meet at a minimum the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations (CCR) Title 13, Chapter 9, Sec. 2423(b)(1). All marine commercial harbor craft, except gasoline-powered small craft, shall meet at a minimum the Tier 2 Marine Engine Emission Standards (CCR Title 17, Sec. 93118.5).

Mitigation Measures for Special-Status Species

MM B-1 **Implement an Invasive Marine Species Control Plan**. PG&E shall develop and implement an Invasive Marine Species Control Plan prior to any in-water work. The plan shall include measures designed to effectively limit the introduction and spread of invasive marine species. PG&E shall submit this plan to the CPUC for approval at least 60 days before the start of marine activities. Vessels originating outside San Francisco Bay shall follow existing compliance measures established by the California State Lands Commission as part of the Marine Invasive Species Program, relating to hull fouling and ballast water control. In addition, if used outside the San Francisco Bay area prior to use on this project, the hydroplow and associated equipment shall be examined and any invasive species handled and disposed of according to the developed plan. Similarly, if the equipment is to be used outside the San Francisco Bay after this use, the equipment shall be examined and cleaned prior to leaving the area.

PG&E shall coordinate plan preparation with the CPUC, U.S. Coast Guard, U.S. Army Corps of Engineers, National Marine Fisheries Service [NMFS], Regional Water Quality Control Board, and California Department of Fish and Wildlife [CDFW] as appropriate. The plan shall include: environmental training for all crew members working in marine areas addressing invasive marine species and actions to be taken to prevent release and spread of invasive marine species. Training shall include procedures for safe removal and disposal of any invasive species found on project equipment. Before and after boats and equipment leave the water, a qualified biologist (approved by the CPUC) shall assist crew members in removing plants, plant debris, and any other potentially invasive species.

MM B-2 **Protect marine mammals from high noise levels.** PG&E shall consult with the National Marine Fisheries Service (NMFS) to determine whether Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) for marine mammals is necessary. If NMFS determines that an IHA or LOA is not necessary, PG&E shall submit evidence of this determination to the CPUC prior to the start of marine construction activities.

Monitoring. PG&E shall prepare and implement a Marine Mammal Monitoring Plan. PG&E shall submit this plan to the CPUC for approval before the start of marine activities. The Marine Mammal Monitoring Plan shall include the following elements:

- Establishment of an appropriate buffer zone around the work area, generally 400 feet or as defined in consultation with NMFS, that would require work be slowed or otherwise modified if the work approaches a marine mammal within the established buffer zone.
- A qualified biologist (approved by the CPUC) shall be on board the hydroplowing ship during construction.
- The qualified biologist shall monitor marine mammal presence and behavior in the vicinity of the ship and the surface above hydroplow operations.
- The qualified biologist shall have the authority to slow or stop work, if safe to do so, and shall consult with the CPUC and NMFS about the implementation of additional minimization measures if, based on observations, project construction appears to be disrupting marine mammal behavior in ways that indicate harassment or injury.
- Any disruption of marine mammal behavioral patterns shall be reported to the CPUC and NMFS within two working days with a description of actions taken to curtail work and reduce noise source levels and a demonstration that the disruption caused no potential for injury or mortality.
- PG&E shall submit weekly reports of marine mammal observations to the CPUC during marine construction activities.

As an alternative to preparing and implementing the Marine Mammal Monitoring Plan specified in this mitigation measure, PG&E may provide adequate evidence, to the CPUC for approval at least 30 days before the start of marine activities, based upon actual data collected for this project or other projects using similar equipment in a similar submarine environment, that demonstrates to the satisfaction of the CPUC that underwater noise source levels generated by the project hydroplow and marine activities cannot not be reasonably expected to exceed the 180 dB threshold recently used by NMFS for marine mammal protection.

MM B-3 **Protect marine species**. PG&E shall consult with CDFW to obtain an Incidental Take Permit for longfin smelt or a determination from the agency that the project is not likely to adversely affect longfin smelt.

Fish screens. As stated in APM BIO-6, all hydroplow water jet intakes shall be covered with a mesh screen or screening device to minimize potential for impingement or entrainment of fish species, especially longfin smelt. Additional requirements to minimize or prevent entrainment and impingement are also required to supplement APM BIO-6:

- The mesh screen or screening device shall comply with applicable state (CDFW) and federal (NMFS) criteria for screening intakes such as those found in NMFS's 1996 *Juvenile Fish Screen Criteria for Pump Intakes* or as required by NMFS and CDFW.

Monitoring. A qualified biologist (approved by CPUC) shall verify that the screens are in place at the beginning of each hydroplow work period and examine them for impinged longfin smelt or other fish species at the end of each work period, or whenever the screens are cleaned or the hydroplow is raised out of the water during the cable laying.

Injury or mortality shall be reported to CPUC within two working days, with a discussion of actions taken to prevent or minimize any additional longfin smelt injury or mortality or as otherwise determined with CDFW and NMFS. Any injury or mortality of longfin smelt shall also be reported as determined in permitting discussions with CDFW and NMFS.

MM B-4 **Avoid impacts to nesting birds.** This measure supersedes APM BIO-2. If onshore construction activities occur during the avian nesting season, a preconstruction survey for nesting birds shall be conducted by a qualified wildlife biologist (PG&E employees or contractors, approved by the CPUC) within 7 days prior to the start of noise-generating construction or vegetation trimming or removal activities in any new work area. Surveys shall cover all public areas within 50 feet of work sites. For San Francisco County, the avian nesting season regularly occurs between February 15 and August 31, but a survey may be appropriate earlier or later depending on species, location, and weather conditions as determined by the qualified wildlife biologist.

Work areas that cause no appreciable increase in ambient noise, such as where work is performed manually, by hand, or on foot and activities that cause no observable disturbances to nesting birds (e.g., operating switches, driving on access roads, normally occurring activities at substations, staging or laydown areas) would not warrant a preconstruction survey.

Protective measures for birds. If an active bird nest for a species covered by the Migratory Bird Treaty Act or California Fish and Game Code is found within 50 feet of project work areas, the qualified biologist shall determine appropriate protective measures to reduce the likelihood of nest failure. Protective measures for active nests shall include one or more of the following: avoiding or limiting certain project-related activities within a designated buffer zone surrounding the nest, shielding of the nest from project disturbance using a temporary soundwall or visual screen, or other shielding method as appropriate. The width of the buffer zone (in which work may not occur) shall be based on the disturbance tolerance and conservation status of the species, and the nature of planned construction activities and other human activities in the immediate area. Buffer zones of less than 50 feet shall be allowed only when planned construction activities involve relatively low disturbance or birds have demonstrated tolerance of noise and disturbance. Buffers shall not apply to construction-related vehicle or pedestrian traffic using city streets and sidewalks. As appropriate, exclusion techniques may be used for any construction equipment that is left unattended for more than 24 hours to reduce the possibility of birds nesting in the construction equipment. An example exclusion technique is covering equipment with tarps.

Bird species found building nests within the work areas after specific project activities begin may be assumed tolerant of that specific project activity; the CPUC approved, qualified biologist shall implement an appropriate buffer or other appropriate measures to protect such nests, after taking into consideration the position of the nest, the bird species nesting on site, the type of work to be conducted, and duration of the construction disturbance.

Protective measures for special-status birds. If an active nest for a special-status bird is found, PG&E shall record the position of the nest in the monitoring report and notify the CPUC through the reporting process outlined below. The qualified biologist shall implement buffers and set other protective measures (described above), as appropriate, to protect special-status nesting birds from construction activities in consultation with CPUC, and as appropriate the California Department of Fish and Wildlife (CDFW) and/or United States Fish and Wildlife Service (USFWS). Buffer zones of less than 50 feet shall be allowed only when planned construction activities involve relatively low disturbance or birds have demonstrated tolerance of noise and disturbance. Requests for buffers of less than 50 feet for special-status nesting birds must be submitted to the CPUC's independent biologist(s) for review. The CPUC's independent biologist shall respond to PG&E's request for a buffer reduction (and buffer reduction terms) within one business day; if a response is not received, PG&E can proceed with the buffer reduction. If nesting birds in the presence of the CPUC-approved qualified biologist show signs of intolerance to construction activities within a reduced buffer zone, the qualified biologist shall reinstate the recommended buffer. The recommended buffer may only be reduced again following the same process, as identified above, and after the CPUC-approved, qualified biologist has determined that the nesting birds are no longer exhibiting signs of intolerance to construction activities. Nests shall be monitored daily by the qualified biologist when construction is active at that location. Any potentially significant construction-related disturbance shall be reported to CPUC, CDFW, and USFWS.

Monitoring. Active nests shall be monitored at least once daily during construction until nestlings have fledged and dispersed or until nest failure has been documented. Daily nest checks shall be at least 30 minutes or more as determined by the qualified biologist 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 qualified biologist shall record the 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. The qualified biologist shall 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. If the qualified biologist determines that project activities are contributing to nest disturbance, they shall notify CPUC (and CDFW/USFWS as appropriate in the case of special-status bird nests) and coordinate with the Construction Manager to limit the duration or location of work, and/or increase appropriate protective measures (as described above).

Reporting. If there are active nests present within 50 feet of the project area during construction, a weekly written report shall be submitted to CPUC. A final report shall be submitted to CPUC at the end of each nesting season summarizing all nest monitoring results and nest outcomes for the duration of project construction. No avian reporting shall be required for construction occurring outside of the nesting season and if construction activities do not occur within a reduced buffer during any calendar month. Nests located in areas of existing human presence and disturbance, such as in yards of private residences, or within commercial and or industrial properties are likely acclimated to disturbance and may not need to be monitored, as determined by the CPUC-approved, qualified biologist and approved by the CPUC's independent biologist.

Permits. Prior to the start of construction, PG&E may obtain a permit authorized by Section 3503 and/or Section 3503.5 of the California Fish and Game Code, or by any regulation adopted pursuant thereto, pertaining to nesting birds. If PG&E obtains such a permit under the above authorities, where that permit conflicts with the measures outlined above, the conditions of the permit shall govern.

Mitigation Measure for Preservation of Unanticipated Discoveries

MM C-1 **Unanticipated discoveries of cultural deposits.** This mitigation supersedes APM CUL-4. 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. The CPUC-approved cultural resources specialist shall be contacted immediately to examine the discovery and determine if further investigation 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 subject to further impact, the CPUC-approved cultural resource specialist/archaeologist shall evaluate the resource and determine whether it is: (1) eligible for the CRHR (and thus a historical resource for purposes of CEQA); or (2) a unique archaeological resource as defined by CEQA. If the resource is determined to be neither a unique archaeological nor an historical resource, work may commence in the area. If the resource meets the criteria for either an historical or unique archaeological resource, or both, work shall remain halted, and the cultural resources specialist/archaeologist shall consult with CPUC staff regarding methods to ensure that no substantial adverse change would occur to the significance of the resource pursuant to CEQA Guidelines Section 15064.5(b).

Preservation in place, i.e., avoidance, is the preferred method of mitigation for impacts to historical or unique archaeological resources. Alternative methods of treatment that may be demonstrated by the CPUC to be effective include evaluation, collection, recordation, and analysis of any significant cultural materials in accordance with a Cultural Resources Management Plan prepared by the CPUC approved qualified cultural resource specialist/archaeologist. The methods and results of evaluation or data recovery work at an archaeological find shall be documented in a professional level technical report to be filed with CHRIS. Work may commence upon completion of treatment, as approved by the CPUC.

Mitigation Measure to Avoid Known and Potential Cultural Resources

MM C-2 **Avoid known and potential shipwreck locations.** This measure incorporates and supplements portions of APM CUL-2, Resource Avoidance. During installation of the submarine cable, PG&E and its contractors shall map the as-built alignment of the cable in relation to known cultural resources, and the contractors shall ensure that the cable passes at least 100 feet to the west of the known shipwreck located in the northeastern portion of the marine geophysical survey area and mapped on NOAA Chart no.18650. In addition, prior to the installation of the cable, PG&E and its contractors shall map a 50 foot buffer around the magnetic anomaly identified by OSI as anomaly no. M63 in the southern half of the marine geophysical survey area and located at 6019099E, 2106491N, as the anomaly may result from the remains of a shipwreck buried beneath the bay floor in that location. PG&E and its contractors shall ensure that no sediment disturbing excavation or hydroplowing is conducted within the 50 foot buffer zone. If the project cannot be routed around the anomaly, additional evaluation and mitigation as detailed in Mitigation Measure C-1, for unanticipated discoveries, and detailed in the Unanticipated Discoveries Plan may be necessary prior to excavation.

Mitigation Measure for Underground Transmission Line Construction Noise

MM N-1 **Implement General Noise Control Measures**. PG&E shall implement the following general noise control measures in addition to APMs NO-1 to NO-7, with APMs NO-2 and NO-3 superseded:

- PG&E and contractors shall use equipment that incorporates noise-control elements into the design.
- PG&E and contractors shall ensure equipment exhaust stacks and vents are directed away from buildings.
- Where use of pneumatic tools, such as impact tools (e.g., jack hammers and pavement breakers), is unavoidable, a noise source screen such as a barrier around the activity using the tools, an external noise jacket, or an exhaust muffler on the compressed air exhaust shall be used and shall be designed to reduce noise levels from the source by 10 dBA.
- PG&E shall include noise control requirements in specifications provided to construction contractors. Such contract specifications would include, but not be limited to, performing all work in a manner that minimizes noise; use of equipment with effective mufflers; undertaking the most noisy activities during times of least disturbance to surrounding residents, day care operations, and commercial uses; and using haul routes that avoid residential buildings inasmuch as such routes are otherwise safely available.
- PG&E shall respond to and track complaints pertaining to construction noise. PG&E shall provide a complaint hotline phone number that shall be answered at all times during construction and designate an on-site construction complaint and enforcement manager for the project. The noise complaint and response process shall be described in the residential notifications required under APM NO-5 and posted publicly near work areas that are within 300 feet of residential buildings or day care operations.

Mitigation Measure for 24-Hour HDD Noise

MM N-2 **Obtain Special Permit for Nighttime HDD Noise.** This mitigation measure is to supplement and ensure enforceability of APM NO-6 for noise sources at the Embarcadero HDD Transition Area.

- PG&E shall apply to the San Francisco Director of Public Works and obtain a special permit for nighttime or 24-hour activity at the Embarcadero HDD Transition Area, consistent with Section 2908 of the Police Code. Prior to commencing construction of the HDD, PG&E shall provide to the CPUC a copy of the special permit or evidence that no permit is required by San Francisco.
- PG&E shall provide to the CPUC at least 7 days prior to commencing construction of the Embarcadero HDD Transition Area the results of actual ambient hourly (Leq) noise measurements for each hour between 8:00 p.m. to 7:00 a.m. at the edge of the

nearest private property containing residential use obtained from monitored noise levels as specified in APM NO-6.

- PG&E and contractors conducting nighttime work at the Embarcadero HDD Transition Area, between 8:00 p.m. to 7:00 a.m., shall implement noise attenuation features, including acoustical barriers, blankets and enclosures as identified in APM NO-6, to achieve no more than 5 dBA above existing local ambient noise levels at the edge of the nearest private property containing residential use, based on 1-hour Leq.
- PG&E shall provide a report to the CPUC actions taken to reduce the duration or level of noise within 48 hours of monitoring noise levels found to be in excess of the ambient noise level by 5 dBA, at the edge of the nearest private property containing residential use, based on 1-hour Leq.

Mitigation Measure for Accidental Utility Service Disruptions

MM UT-1 **Protect underground utilities.** Prior to commencing construction of the underground transmission line, PG&E shall submit to the CPUC written documentation of the following:

- Construction plans designed to protect existing utilities, showing the dimensions and location of the finalized alignment as well as the corrosion and induced currents study;
- Records that the Applicant provided the plans to the City and County of San Francisco for review, revision and final approval;
- Construction plans approved by the City and County of San Francisco detailing the steps taken to prevent damage to two large SFPUC storm sewers, including but not limited to an appropriate shoring plan, work zone restrictions, and setbacks for the adjacent structures, at the following locations: (1) in the intersection of Spear and Folsom; and (2) at the end of the route as it turns to enter Embarcadero Substation;
- Evidence of coordination with all utility owners within the approved right-of-way, including their review of construction plans, results of the induced current and corrosion potential analysis, and a description of any protection measures or compensation to be implemented to protect affected facilities;
- Copy of the Applicant's database of emergency contacts for utilities that may be in close proximity or require monitoring during construction of the project;
- Evidence that the project meets all applicable local requirements;
- Evidence of compliance with design standards; and
- Copies of any necessary permits, agreements, or conditions of approval.

Based on the analysis and conclusions of the Initial Study, the impacts of the project as proposed by PG&E would be mitigated to less than significant levels with the implementation of the mitigation measures presented herein, which have been incorporated into the Proposed Project.

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2. Environmental Determination

2.1 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" and requiring implementation of mitigation as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture & Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☐ Geology/Soils
☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☒ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☐ Transportation/Traffic	☒ Utilities/Service Systems	☐ Mandatory Findings of Significance

2.2 Environmental Determination

On the basis of this initial evaluation:

☐ I find that the Proposed Project COULD NOT have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.

☒ I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A **MITIGATED NEGATIVE DECLARATION** will be prepared.

☐ I find that the Proposed Project MAY have a significant effect on the environment, and an **ENVIRONMENTAL IMPACT REPORT** is required.

☐ I find that the Proposed Project may have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the Proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the Proposed Project, nothing further is required.

Billie Blanchard

Billie Blanchard, Project Manager
Energy Division CEQA Unit
California Public Utilities Commission

AUGUST 12, 2013
Date

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3. Introduction to the Initial Study

3.1 Proposed Project Overview

Pacific Gas and Electric Company (PG&E), a regulated California utility, filed an application and Proponent's Environmental Assessment (PEA) with the California Public Utilities Commission (CPUC) on December 11, 2012 (Application No. A.12-12-004), for a Certificate of Public Convenience and Necessity (CPCN) to authorize construction of the Embarcadero-Potrero 230 kilovolt (kV) Transmission Project (Proposed Project). The CPUC Energy Division deemed the PEA and Application complete on January 10, 2013.

The proposed Embarcadero-Potrero 230 kV Transmission Project would include construction, operation, and maintenance of a new 230 kV transmission line entirely within the City and County of San Francisco from the Embarcadero Substation at the corner of Fremont and Folsom Streets, to the Potrero Switchyard on Illinois Street between 22nd and 23rd Streets.

The new 230 kV transmission line would be approximately 3.5 miles in total length, including approximately 2.5 miles to be installed offshore in the San Francisco Bay, 0.4 miles to be installed in horizontal directional drills (HDD) between onshore transition points and the bay, and approximately 0.6 miles to be installed underground in paved areas, including Spear Street and Folsom Street in San Francisco's Rincon Hill neighborhood. Construction of a new 230 kV switchyard would occur near the existing Potrero Switchyard, but no new substation work is proposed to occur at the existing Embarcadero Substation beyond the proposed termination of the new cable into the 230 kV bus.

PG&E's project objectives include improving the reliability of the existing transmission system in San Francisco to provide a high likelihood of continued electric service to downtown San Francisco in the event of overlapping outages on both of two existing 230 kV transmission lines that presently feed Embarcadero Substation. Additional details on the objectives appear in Section 4 (Project Description), specifically in Section 4.9.1 (Project Objectives).

3.2 Environmental Analysis

3.2.1 CEQA Process

This Initial Study (IS) has been prepared pursuant to the California Environmental Quality Act (CEQA), the amended State CEQA Guidelines (14 CCR 15000 et seq.), and the CPUC CEQA rules (Rule 2.4). The purpose of the Initial Study is to inform the decision-makers, responsible agencies, and the public of the Proposed Project, the existing environment that would be affected by the project, the environmental effects that would occur if the project is approved, and proposed mitigation measures that would avoid or reduce environmental effects.

A Mitigated Negative Declaration (MND) has been prepared based on the assessment of potential environmental impacts identified in the IS. All potentially significant impacts associated with the project can be mitigated to a level below significance; therefore, an MND can be adopted by the CPUC in accordance with Section 21080 of the Public Resources Code and CEQA Guidelines Section 15070.

3.2.2 CEQA Lead Agency

The CPUC is the lead agency for review of the project under CEQA because it must make a decision whether to adopt the MND and to approve or deny the CPCN.

3.2.3 Initial Study

The IS presents an analysis of potential effects of the Proposed Project on the environment. The IS relies on information from PG&E's PEA and associated submittals, site visits, CPUC data requests, and additional research.

Construction activities and project operation could have direct and indirect impacts on the environment. The following environmental parameters are addressed based on the potential effects of the Proposed Project and potential growth-inducing or cumulative effects of the Proposed Project in combination with other projects:

- Aesthetics
- Agricultural Resources
- Air Quality
- Greenhouse Gases
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Traffic and Transportation
- Utilities and Service Systems
- Corona and Induced Current Effects
- Mandatory Findings of Significance

The IS has been organized into the following sections:

- Section 3: Introduction. Provides an introduction and overview describing the Proposed Project and the CEQA process.
- Section 4: Project Description. Presents the project objectives and provides an in-depth description of the Proposed Project, including construction details and methods.
- Section 5: Initial Study: Environmental Analysis and Mitigation. Includes a description of the existing conditions and analysis of the Proposed Project's potential environmental impacts, and identifies mitigation measures to reduce potentially significant impacts to less than significant levels.
- Section 6: Mitigation Monitoring Plan. Includes applicant proposed measures (APMs) and mitigation measures that PG&E must implement as part of the project, actions required to implement these measures, monitoring requirements, and timing of implementation for each measure.
- Section 7: References. Lists the sources of information used to prepare the IS.
- Appendix A: Emission Calculations
- Appendix B: Special-status Plants and Wildlife
- Appendix C: List of Preparers. Identifies the individuals responsible for preparation of the IS.

4. Project Description

Pacific Gas and Electric Company (PG&E), a regulated California utility, proposes to construct the Embarcadero-Potrero 230 kV Transmission Project (Proposed Project). The project would include construction, operation, and maintenance of a new 230 kV transmission line in San Francisco between the Embarcadero Substation, at the corner of Fremont and Folsom Streets, and the Potrero Switchyard on Illinois Street between 22nd and 23rd Streets. The new transmission line would be located primarily offshore in the San Francisco Bay, with shorter segments underground in paved city streets.

4.1 Project Title

Embarcadero-Potrero 230 kV Transmission Project
Application No. A.12-12-004

4.2 Project Sponsor's Name and Address

Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, California 94105

4.3 Lead Agency Name and Address

California Public Utilities Commission
Energy Division
505 Van Ness Avenue, Fourth Floor
San Francisco, California 94102

4.4 Lead Agency Contact Person and Phone Number

Billie Blanchard, Project Manager
Energy Division CEQA Unit
California Public Utilities Commission
505 Van Ness Avenue, Fourth Floor
San Francisco, California 94102
(415) 703-2068
E-mail: billie.blanchard@cpuc.ca.gov

4.5 Project Location

The proposed Embarcadero-Potrero 230 kV Transmission Project would be entirely within the City and County of San Francisco (the City). The transmission line would be approximately 3.5 miles in total length, including approximately 2.5 miles to be installed offshore in the San Francisco Bay, 0.4 miles to be installed in horizontal directional drills (HDD) between onshore transition points and the bay, and approximately 0.6 miles to be installed underground in paved areas, including Spear Street and Folsom Street in San Francisco's Rincon Hill neighborhood and in 23rd Street east of Illinois Street in the Central Waterfront area.

Figure 4-1 is a map of the vicinity and Figure 4-2 illustrates the project location.

4.6 Surrounding Land Uses and Setting

The northern end of the Proposed Project would be at the existing PG&E Embarcadero Substation at the corner of Fremont and Folsom Streets in the Rincon Hill area. Underground portions of the transmission line would be in the paved right-of-way of Folsom Street and Spear Street, with the proposed northern HDD transition point in Spear Street under the San Francisco-Oakland Bay Bridge (PG&E, 2012a, Section 3.10.3.1).

Land uses along Folsom Street comprise a combination of commercial and residential uses, including apartments and condominium towers, parking lots, and the Transbay Temporary Terminal. Residential uses along Folsom Street include apartments at 333 First Street, apartments between Fremont and Beale Streets, and the Infinity Towers high-rise residential complex between Main and Spear Streets. Commercial uses include parking lots, vacant land that is part of the Transbay Redevelopment Project Area, and commercial businesses and offices.

Along Spear Street, the block between Folsom and Harrison contains the Hills Plaza on the east, 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. Residential land uses on Spear Street consist of apartments and condominiums, including the Infinity Towers at Spear Street and Folsom, and the street-level Harbor Lofts, live/work lofts and townhomes, at 400 Spear Street south of Harrison. The street-level Harbor Lofts would be the nearest residences at approximately 25 feet from the nearest edge of construction activity. The Bay Bridge crosses above Spear Street near the cul-de-sac at the southern end of the street, adjacent to two commercial buildings and The Embarcadero.

The proposed transmission line would enter the bay via the HDD at a point between Pier 28 and the Pier 30/32 parking complex, and would continue in a direction perpendicular to the shoreline until it becomes generally between 1,500 and 2,500 feet offshore. Turning south to parallel the shoreline from Piers 28 and 30/32, the route would continue past the marina at Pier 40, the ballpark, south past Pier 70, and return to land at the east end of 23rd Street. PG&E designed the proposed route to avoid as many underwater obstacles as possible, such as charted wrecks, abandoned piers, established cable areas, or other obstructions that had been identified during the feasibility stage of design. The marine portion of the route would not be within the north/south shipping lanes or designated anchoring areas. The route would be inland from the existing Trans Bay Cable (TBC) transmission line, which, as shown in Figure 4-2, is located on the bay floor between the City of Pittsburg and the east end of 23rd Street.

The southern end of the proposed transmission line would be at a new Potrero 230 kV Switchyard on Illinois Street between 22nd and 23rd Streets, in the Central Waterfront area. The proposed route would run under the alignment of 23rd Street to the proposed southern HDD transition point in 23rd Street east of Illinois Street. At the shoreline and on the south side of 23rd Street are a DHL facility (freight and logistics company) at 401 23rd Street, a storage facility, and the high voltage direct current (HVDC) converter station for the Trans Bay Cable. The new 230 kV Potrero Switchyard would be within the site of the former Potrero Power Plant site now owned by GenOn Energy, Inc., on the north side of 23rd Street. The nearest residence would be about 700 feet to the west, on Third Street.

Source: PG&E, 2012.

Figure 4-1
Project Vicinity

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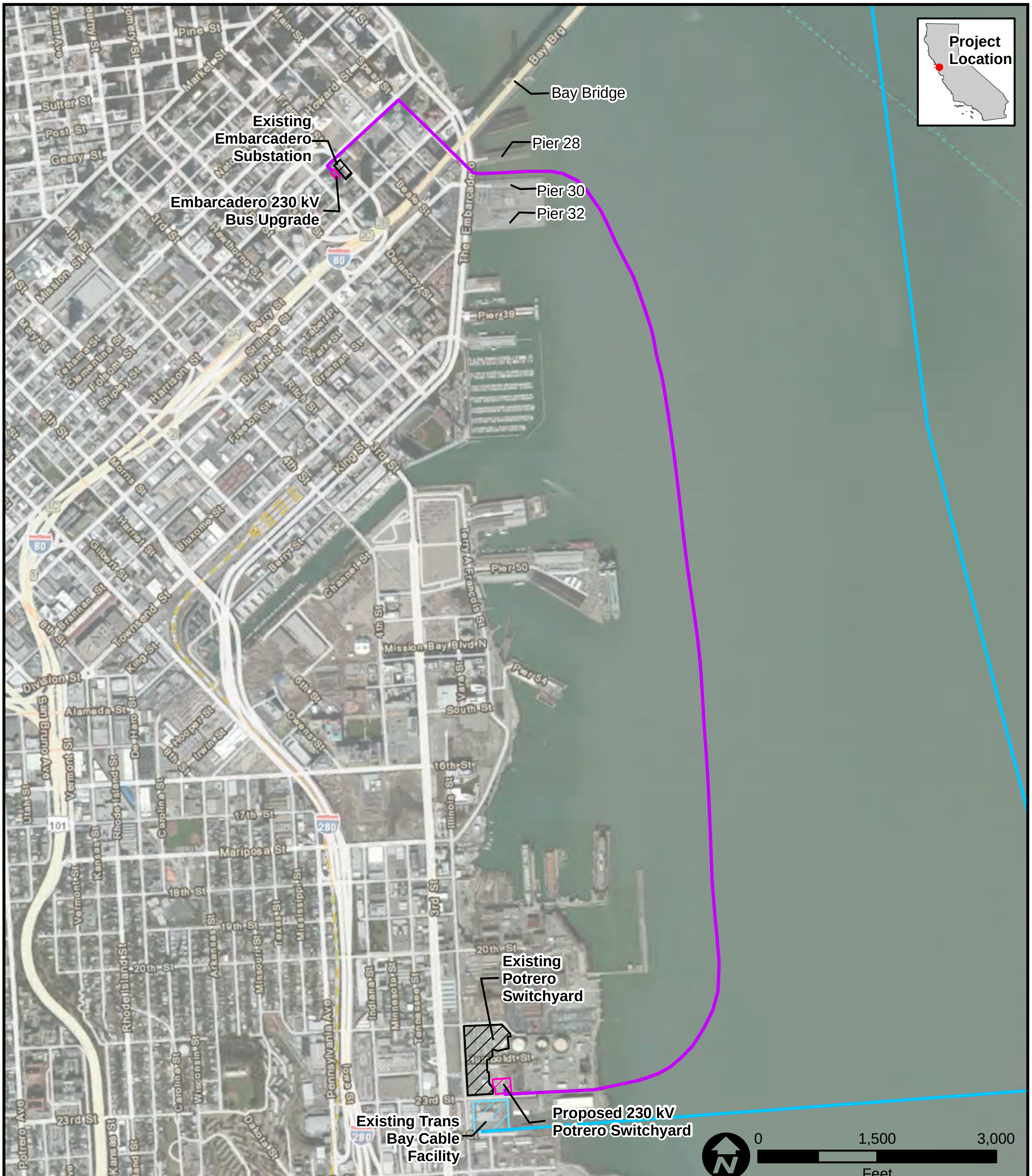

Aspen Environmental Group

Proposed Embarcadero-Potrero 230 kV Project

Existing 400 MW Trans Bay Cable

Existing Substation/Switchyard

Proposed Substation/Switchyard

Existing Trans Bay Cable Facility

Figure 4-2

Project Location

Source: PG&E 2012, PLATTS 2010

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4.7 General Plan Designation

The Proposed Project would be entirely within San Francisco and in the San Francisco Bay. Although the Proposed Project would not be subject to local plans and policies, this assessment considers project consistency with the federal, state, and local plans, including the San Francisco General Plan, consistent with CPUC General Order 131-D.

San Francisco General Plan, Rincon Hill Area Plan, and Central Waterfront Area Plan. The San Francisco General Plan contains ten Area Plans that set specific policies and guidelines for certain neighborhoods in the City. The Embarcadero Substation is within the Rincon Hill planning area, and the Potrero Switchyard is within the Central Waterfront planning area. Project construction within Folsom Street would also be within the Transit Center District Plan (TCDP) area and the Transbay Redevelopment Project Area.

Port of San Francisco Waterfront Land Use Plan. All submarine portions of the proposed transmission line, and portions of the proposed Potrero 230 kV Switchyard, would be within the boundary of the Port. Additionally, onshore portions east of and including the northern HDD transition in Spear Street would be within the Port's South Beach/China Basin Waterfront Subarea, adjacent to Seawall Lot 328 (SWL 328).

San Francisco Bay Conservation and Development Commission (BCDC), San Francisco Bay Plan and San Francisco Waterfront Special Area Plan. BCDC's jurisdiction includes the tidal waters of the San Francisco Bay and a 100-foot shoreline band. The submarine portion of the route would require an administrative permit from the BCDC for work within the bay and within the 100-foot shoreline band. In addition to installation of the submarine cable, a localized excavation may be made in the seafloor sediments at the HDD bore hole exit point to receive the heavy drilling fluids when the pilot hole is exited and during the pipe pulling operations. The mud captured at each HDD exit would be pumped up to a barge and disposed of per appropriate permits and regulations (see Table 4-6 in Section 4.14). Permitting by the U.S. Army Corps of Engineers (USACE) would be subject to a coastal management zone consistency determination by BCDC.

California State Lands Commission (CSLC) Jurisdictional Determination. The submarine portion of the route would be within lands that the State has legislatively granted to the City and County of San Francisco, according to a review conducted by the CSLC staff and summarized in a letter from CSLC to PG&E dated July 10, 2012. The City and County of San Francisco manages all day-to-day administration of the legislative grant; however, the CSLC has certain residual and review authority over these lands (CSLC, 2012).

4.8 Zoning

The Proposed Project would occur within the following zoning districts of the San Francisco Planning Code:

- Rincon Hill Downtown Residential Mixed Use District: includes the existing Embarcadero Substation and the Embarcadero 230 kV Bus Upgrade Project.
- TB DTR Transbay Downtown Residential District: Folsom Street between Fremont and Spear.
- RC-4 Residential-Commercial High Density: Folsom Street between Beale and Spear.
- M-1 Light Industrial: Spear Street near The Embarcadero and the proposed northern HDD transition.

- M-2 Heavy Industrial: includes the proposed Potrero 230 kV Switchyard and staging areas, and an area near The Embarcadero and the proposed northern HDD transition.
- PDR-1-G Production, Distribution & Repair Districts: areas west and south of Potrero Switchyard and proposed southern HDD transition.

4.9 Project Overview

The Proposed Project would include construction, operation, and maintenance of a new, single-circuit, 230 kV transmission line of approximately 3.5 miles between PG&E's Embarcadero Substation and Potrero Switchyard.

PG&E intends the Proposed Project to enhance the reliability of PG&E's electric service to San Francisco, and particularly to the downtown area served by the Embarcadero Substation, given the significant adverse impacts that a service outage would have on the citizens and economy of San Francisco.

The timeline for construction and testing would be approximately 22 months. During construction, building the new transmission line would require approximately 15 months of work offshore and in city streets, overlapping with 22 months of work to develop the new Potrero 230 kV Switchyard.

4.9.1 Project Objectives

PG&E states the following objectives for the Proposed Project in the CPCN application:

> *1) Improve reliability of PG&E's 230 kV transmission system in San Francisco by constructing a new 230 kV transmission line between Embarcadero Substation and Potrero Switchyard that provides a high likelihood of continued electric service to downtown San Francisco in the event of overlapping outages on both of the two existing 230 kV transmission lines running between PG&E's Martin and Embarcadero substations. Specifically:*
>
> > *(a) To increase substantially the likelihood of continued electric service to Embarcadero Substation in the event of concurrent unplanned outages of both existing 230 kV cables, such as might occur following a major seismic event.*
> >
> > *(b) To provide a high likelihood of continued electric service to Embarcadero Substation in the event of a forced outage of one existing 230 kV cable while the other existing 230 kV cable is subject to a planned outage.*
>
> *2) Construct an economically and technically feasible third 230 kV transmission line to PG&E's Embarcadero Substation along a route, and using construction methods and materials, that increase the likelihood that the new transmission line will remain operable following a major earthquake in the San Francisco Bay Area.*
>
> *3) Interconnect PG&E's San Francisco 230 kV and 115 kV transmission systems at Potrero Switchyard so that each system reinforces the other system in the event of outages or replacements of existing underground cables.*
>
> *4) Construct an economically and technically feasible third 230 kV transmission line to PG&E's Embarcadero Substation from Potrero Switchyard, which is the only PG&E substation on the San Francisco 115 kV network that has sufficient capacity to serve current and expected future Embarcadero loads in the event that both existing 230 kV cables into Embarcadero were out of service.*
>
> *5) In the long term, after the load served from Embarcadero Substation exceeds the capacity of a single existing 230 kV transmission line, improve reliability of PG&E's San Francisco 230 kV trans-*

mission system by having in place a new 230 kV transmission line to PG&E's Embarcadero Substation that will allow PG&E to maintain electric service to all customers served from Embarcadero Substation, with any one of the 230 kV transmission lines serving Embarcadero Substation subject to a planned or forced outage.

6) Construct an economically and technically feasible third 230 kV transmission line to PG&E's Embarcadero Substation before either of the two existing 230 kV transmission lines to PG&E's Embarcadero Substation must be replaced, so that downtown San Francisco is not at risk of a single-cable outage causing a prolonged loss of electric service when one of the two existing 230 kV transmission lines must be replaced.

7) Construct a third 230 kV transmission line to PG&E's Embarcadero Substation so that PG&E may allow one of the two existing 230 kV transmission lines serving Embarcadero Substation to be de-energized to allow infrastructure construction without placing downtown San Francisco at risk of a single-cable outage causing a prolonged loss of electric service.

(pp. 7-8 of PG&E, 2012a)

4.9.2 Purpose and Need

PG&E's CPCN application describes the reasons why public convenience and necessity warrant construction and operation of the proposed transmission facilities. PG&E states that the project is needed to enhance the reliability of PG&E's electric service to San Francisco, and particularly to the downtown area served by Embarcadero Substation (p. 12 of PG&E, 2012a). On March 23, 2012, the California Independent System Operator (CAISO) Governing Board approved the project as needed for reliability as part of its 2011-2012 Transmission Plan (pp. 107-108 of CAISO, 2012).

The Embarcadero Substation is a critical component of the electric transmission system serving much of downtown San Francisco, including the Financial District, Union Square, North Beach, The Embarcadero, Chinatown, Nob Hill, Telegraph Hill, and the South of Market and North of AT&T Park areas including Rincon Hill. The Embarcadero Substation is currently fed by two underground 230 kV cables from Martin Substation in Brisbane. PG&E's 115 kV system in San Francisco is supplied from Martin Substation and also by the Trans Bay Cable (TBC) connection at PG&E's Potrero Switchyard. Unlike PG&E's other San Francisco substations, Embarcadero Substation is not tied into the 115 kV transmission network, so if the two existing Martin-Embarcadero cables are out of service, only a very small number of the affected PG&E customers (representing approximately 10 MW of 305 MW of total load projected in 2016) could be served from another distribution substation. The Proposed Project would address various low-probability but very high impact scenarios under which both Martin-Embarcadero cables are out of service, causing a potentially lengthy loss of electricity in downtown San Francisco (pp. 8-9 of PG&E, 2012a).

The Proposed Project would provide a third cable into Embarcadero Substation from Potrero Switchyard rather than Martin Substation. The Proposed Project would also interconnect PG&E's 230 kV and 115 kV systems in San Francisco at Potrero (pp. 13-14 of PG&E, 2012a). Historically, the Hunters Point and Potrero Power Plants provided generation to meet local reliability needs and supply the 115 kV network. With the power plants now retired, PG&E anticipates that interconnecting the 230 kV and 115 kV systems would provide new benefits to PG&E operations and reliability, including: (a) provide the 115 kV system with an additional source of power through the existing Martin-Embarcadero 230 kV cables; (b) facilitate the eventual replacement of the 115 kV cables, some of which are now 55 to 65 years old; and (c) provide power from the 115 kV system to the 230 kV system if the 115 kV system were operational, but both TBC and the Martin-Embarcadero 230 kV cables were not (p. 11 of PG&E, 2012a).

PG&E has concluded that the Proposed Project is warranted based upon the risk of an overlapping outage of both existing Martin-Embarcadero cables; the impact that such an outage would have upon its customers in San Francisco; and the ability of the Proposed Project to mitigate the risk of outage.

The CPUC must determine during the review of the CPCN application whether the Proposed Project would serve a present or future public convenience and necessity, among other issues, subject to Pub. Util. Code § 1001 et seq. and General Order 131-D.

4.10 Project Components

PG&E proposes to interconnect the new transmission line into the upgraded 230 kV bus at Embarcadero Substation[1] and to install a new 230 kV switchyard adjacent to the existing 115 kV Potrero Switchyard. Table 4-1 provides an overview of the proposed transmission line sections.

Table 4-1. Transmission Line Sections, Approximate Length

Transmission Line Section	Approximate Length
Northern Underground Segment: Embarcadero Substation to HDD Transition Manholes on Spear Street	0.4 mi
Northern HDD Segment	0.2 mi
Submarine Segment at Typical Cable Burial Depth – Offshore	2.5 mi
Southern HDD Segment	0.2 mi
Southern Underground Segment: Potrero Switchyard to HDD Transition Manholes on 23rd Street	0.2 mi
Overall Length: Embarcadero Substation to Potrero Switchyard	3.5 mi

Source: Table 2-1 of PG&E, 2012a.

The Proposed Project involves both transmission and substation/switchyard construction activities consisting of three major elements:

1. Construction of an approximately 3.5-mile, single-circuit 230 kV transmission line in a submarine configuration. The route would be as shown on Figure 4-2, with land-based interconnections to the Embarcadero Substation and Potrero Switchyard, as follows:
   - 0.6 miles of underground three-phase transmission line (three conductors) using 2500 thousand circular mil (kcmil) cross-linked polyethylene (XLPE) copper cable installed in a single underground duct bank with polyvinyl chloride (PVC) conduits from the substations to the landing point for the submarine cables, using open trenching;
   - 0.4 miles of transitional sections, with 2800 kcmil XLPE copper cables (1400 mm^2) installed in high-density polyethylene (HDPE) conduits using HDD methods, where the submarine cables transitions from onshore to offshore; and
   - 2.5 miles of three parallel 2800 kcmil XLPE copper submarine cables laid underneath the sea floor of the San Francisco Bay.

[1] A bus is a conductor that serves as a common connection for two or more circuits within a substation. Its main purpose is to conduct electricity. See Section 4.10.2 for the Embarcadero 230 kV Bus Upgrade project.

2. Termination of the new cable into the 230 kV bus at Embarcadero Substation; see Figure 4-3. The new cable would terminate at Embarcadero Substation at either a new gas-insulated switchgear (GIS) that is under development or, if the new switchgear is delayed, the termination would occur at a modified substation bus inside the existing Embarcadero Substation.
3. Construction of a new 230 kV switchyard near the existing 115 kV Potrero Switchyard at the termination of the new cable, including interconnection of the new 230 kV switchyard and the existing 115 kV Potrero Switchyard via up to two new 230/115 kV transformers; see Figure 4-4. The new switchyard interconnects the 230 kV and 115 kV systems within the City, allowing power to flow from the 115 kV system up to the 230 kV system or from the 230 kV down to the 115 kV system, depending upon system conditions at the time. (pp. 4-6 of PG&E, 2012a)

In addition, construction would involve use of equipment staging sites, laydown yards, equipment and material storage areas, and areas to temporarily store excavated materials near the substations and land routes; see Figure 4-5 (PG&E, 2013). Commercially available off-site office and yard space may also be used.

4.10.1 New 230 kV Transmission Line

The Proposed Project would install a new single-circuit 230 kV alternating current (AC) transmission line between Potrero Switchyard and Embarcadero Substation that is designed to continue operating following a reasonably foreseeable seismic event in the San Francisco area. PG&E's design-basis earthquake event is a moment magnitude (Mw) 7.8 earthquake on the San Andreas Fault, with a peak ground acceleration (PGA) determined at the 84th percentile motions (one standard deviation above the median). (p. 2-14 of PG&E, 2012a)

The proposed transmission line would consist of one 230 kV-rated three-phase circuit, in an underground and submarine route of 3.5 miles. On land, the three-phase circuit would be installed in a single underground duct bank; in the San Francisco Bay the circuit would be installed as three separate cables underneath the bay floor. PG&E would interconnect the new transmission line into a 230 kV bus at Embarcadero Substation and into a new 230 kV switchyard adjacent to the existing 115 kV Potrero Switchyard.

The single-circuit transmission line would use one copper extruded dielectric conductor cable per phase. The transmission line would be designed to be capable of carrying 400 megavolt-amperes (MVA) (1005 A) at the normal conductor temperature rating of 90 degrees centigrade, and up to 458 MVA (1150 A) for 48 hours under emergency conditions with a conductor temperature of 105 degrees centigrade.

Underground Cable

Two underground sections would connect the Potrero Switchyard and Embarcadero Substation to HDD transition manholes. The solid-dielectric XLPE copper conductor underground land cables would be installed in a buried reinforced concrete-encased duct bank system. The dimensions of the duct bank would be approximately 3 feet 7 inches wide by 3 feet 4 inches in height; see Figure 4-6. The trench to be excavated to install the duct bank would be slightly larger, typically approximately 4 feet 6 inches wide by 10 feet deep. At least 3 feet of cover material, or engineered fill (fluidized thermal backfill), would be placed over the top of duct bank. Installing the duct banks and vaults would require excavation and disposal of approximately 6,000 cubic yards (cy).

The three electrical cables would be contained within three 8-inch-diameter PVC conduits with one additional conduit left open as a spare for future use should a single cable fail. Fiber optic lines for system protection and communication would be housed in two 4-inch-diameter conduits that will be installed alongside the 8-inch-diameter conduits and within the concrete duct bank. Most of the duct bank will be in a two-by-two duct configuration with potential transitions to a flat configuration to clear substructures in areas congested with other underground utilities or to fan out to the termination structures at the switchyards.

The northern underground segment between Embarcadero Substation and the northern onshore HDD transition on Spear Street would be approximately 0.4 miles. This segment would extend in a reinforced concrete duct bank northeast under Folsom Street from Embarcadero Substation to Spear Street. The route would turn southeast onto Spear Street toward the proposed northern HDD landing location near the end of Spear Street.

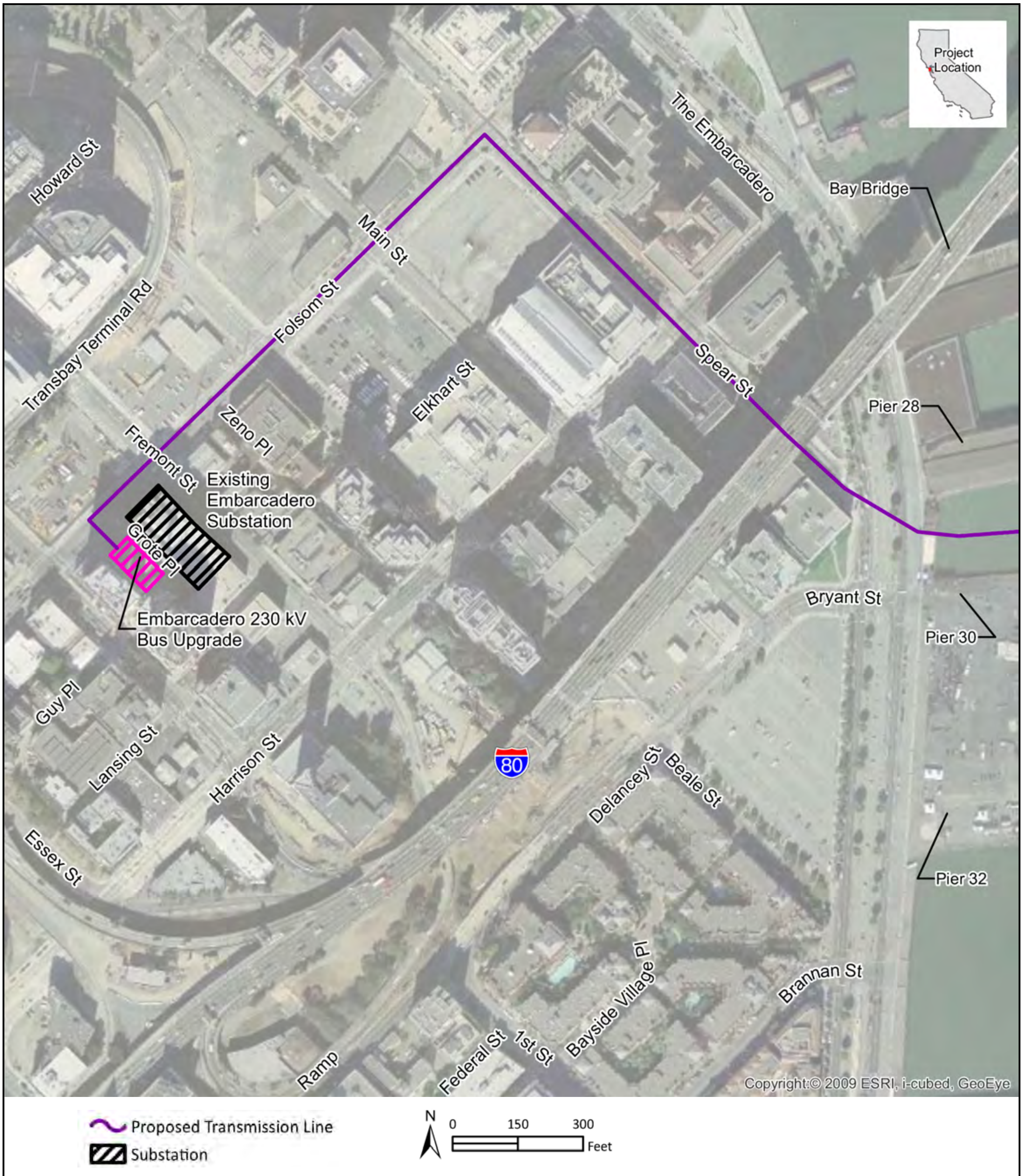
Under PG&E's proposed design, the northern onshore segment would have four vaults, including three at the cable landing location under or near the Bay Bridge, inside which each of the separated electrical phases of the submarine cable would be spliced to a corresponding phase (A, B or C) of the land cable. From these vaults, the three phases of the land cable would be joined in one duct bank, which would connect to a fourth vault in Folsom Street between Fremont and Main Streets.

The southern underground segment between Potrero Switchyard and the southern onshore HDD transition would be approximately 0.2 miles. The cable would exit along the southern boundary of the new Potrero 230 kV Switchyard in an underground concrete duct bank and then turn east beneath 23rd Street. The route would continue east to the southern HDD landing location, which will be located within the HDD entry pits and splice vault work zone depicted on Figure 4-9 (Potrero HDD Transition Area). There would be three vaults at the cable landing location in 23rd Street, inside which each phase of the land cable would be spliced to a corresponding, separated phase (A, B or C) of the submarine cable.

Throughout the length of the underground cable, an approximately 12-foot minimum bending radius would be maintained, and proper support and cable restraint would be applied per PG&E Underground Transmission Design Criteria (ETLS068192) and Installation Guide (ETLS072140) standards (p.2-18 of PG&E, 2012a).

The Proposed Project would generally include a minimum 11-foot burial depth for the onshore underground segments, which would both meet low-cost EMF reduction goals on the northern underground segment (See Section 4.15) and also generally allow the cable to clear all other utilities in the right-of-way, with the exception of two large storm sewers at the following locations: (1) in the intersection of Spear and Folsom; and (2) at the end of the route as it turns to enter the Embarcadero Substation. In both cases, PG&E has stated that the trench can feasibly be lowered sufficient additional depth to clear the sewer (PG&E, 2013).

Additionally, due to utility congestion along the northern underground segment, PG&E performed a two-step analysis to establish that there would be sufficient space in Spear and Folsom Streets to install an 11-foot-deep duct bank (B&V, 2012). First, PG&E obtained preliminary as-built drawings from the San Francisco Department of Public Works based on a recent City sewer replacement and repaving project in Spear Street. PG&E also reviewed underground utility markings on Spear Street made for the City sewer project. The proposed alignment is based on these drawings and markings, and EMF policy goals (described in Section 4.15) (PG&E, 2013); the final alignment may vary somewhat from the proposed alignment to account for the actual physical conditions encountered under the streets.



Source: PG&E, 2012.

Figure 4-3

Embarcadero Substation Area

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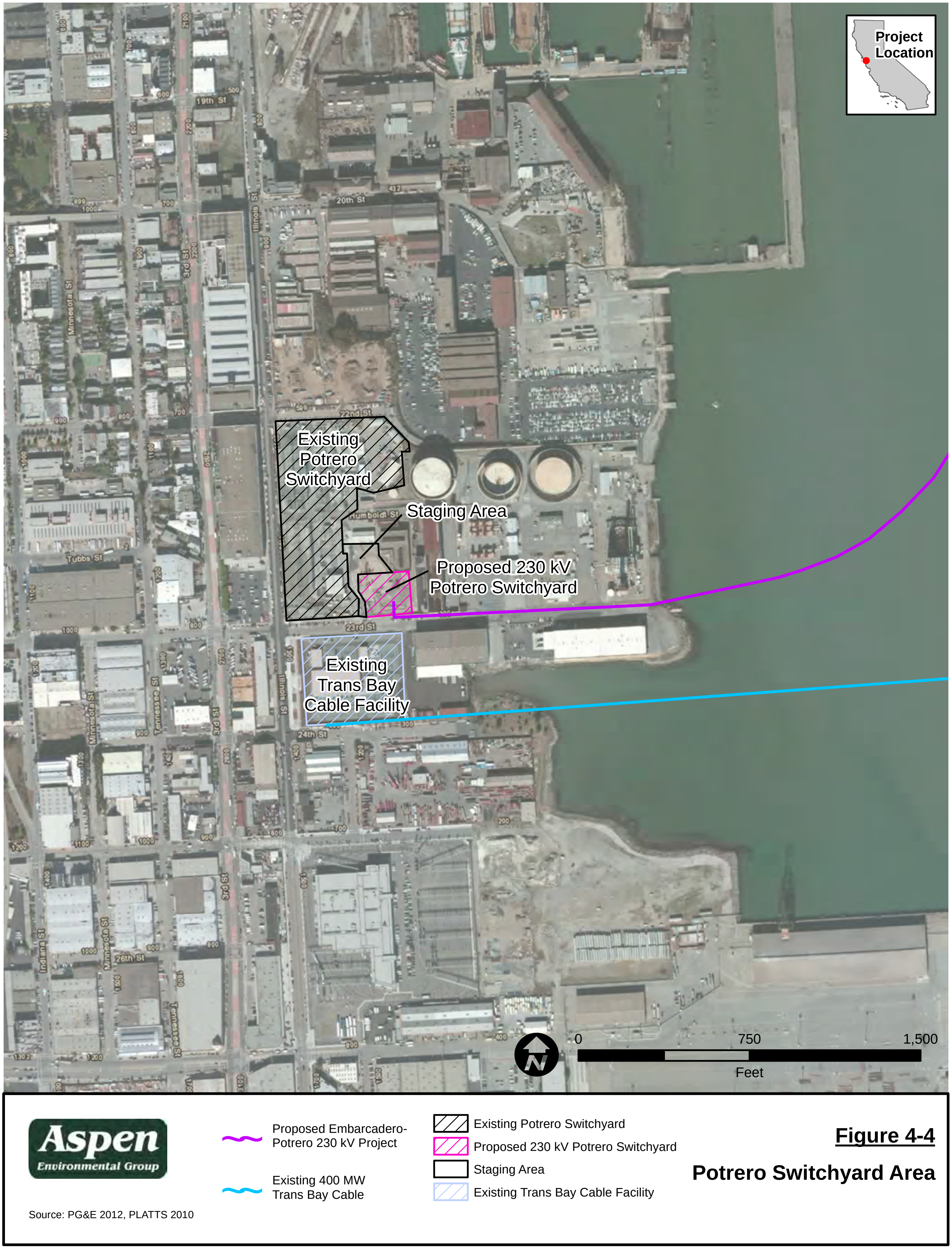

Source: PG&E 2012, PLATTS 2010

Figure 4-4

Potrero Switchyard Area

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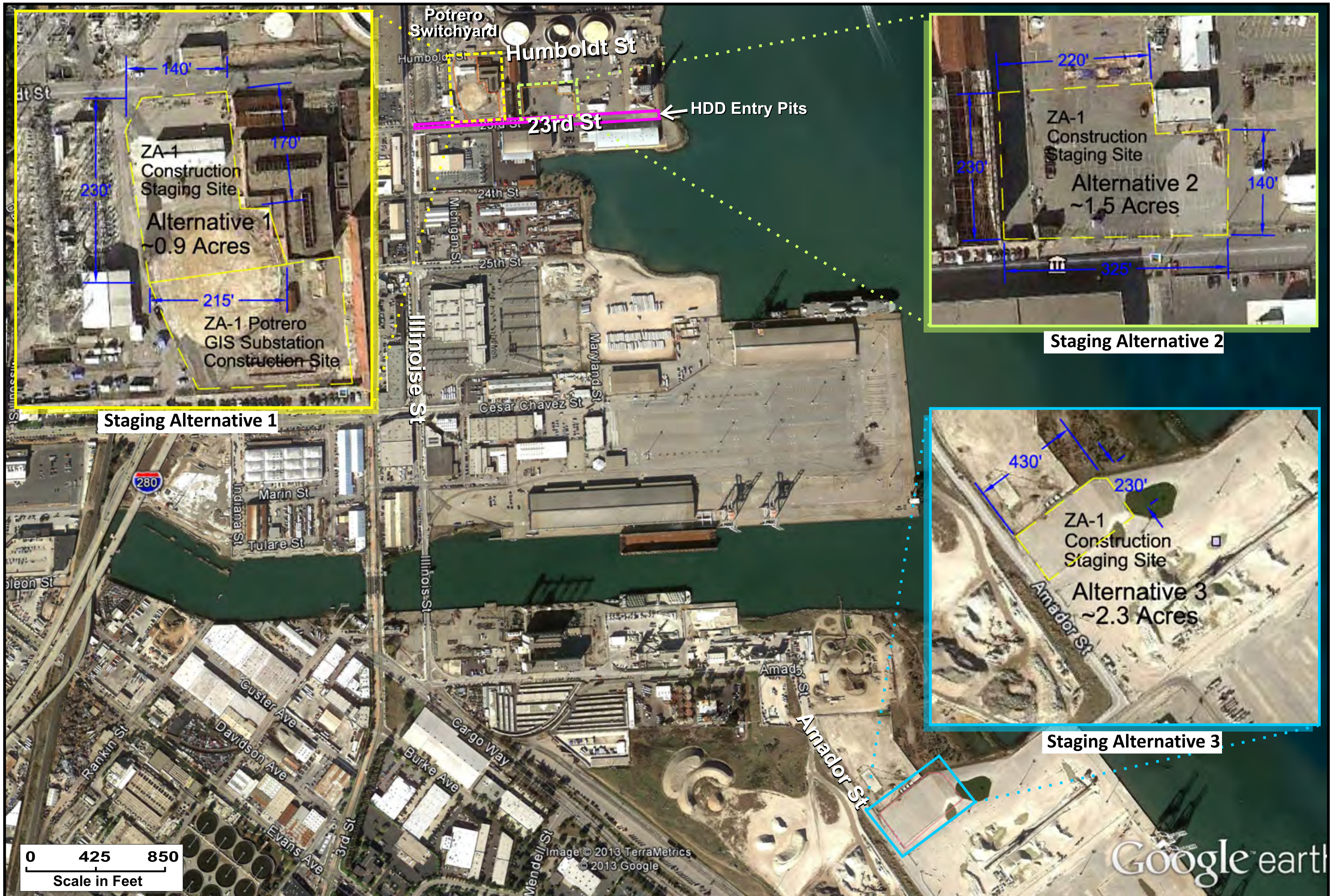

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Source: PG&E, 2012.

Figure 4-5
Potential Staging Locations

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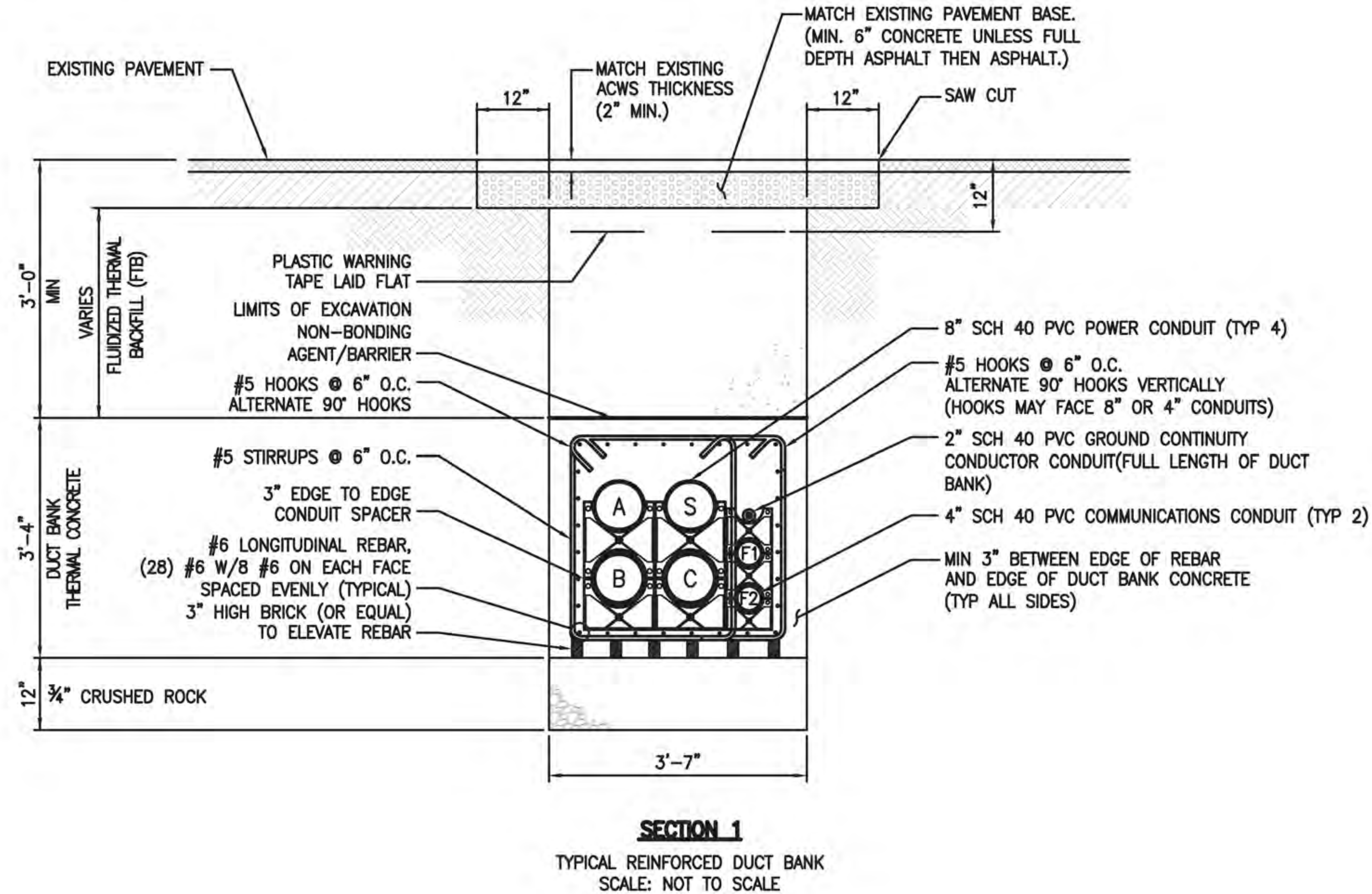


Source: PG&E, 2012.

Figure 4-6
Typical Duct Bank

Secondly, along Folsom Street, PG&E conducted a visual survey of existing utilities as evidenced by their existing vaults. The survey concluded that the intersections of Folsom Street with Spear Street and with Main Street are crowded with utilities. However, PG&E has stated that there is enough room to install the duct bank between the existing utilities at a depth of 11 feet along the north side of Folsom Street (B&V, 2012; PG&E, 2013).

Submarine/Underground Transition Locations

The cables would make two transitions from land to the marine environment: one on the southern end of the route on 23rd Street near Potrero Switchyard and one on the northern end of the route at Spear Street, en route to Embarcadero Substation. At each HDD transition manhole, the onshore entry pits would be up to about 5 feet wide, 8 feet long, and about 6 feet deep, requiring excavation and export of approximately 300 cy of material; see Figure 4-7.

Each transition location requires three HDD borings approximately 1,000 feet in length to extend the three phases of the submarine cable, ground cable, and communications cable from the land. Three HDDs at each transition would be spaced at approximately 10 feet apart on land and gradually flared out to form an approximately 33- to 150-foot separation under water. At each HDD transition location, the underground duct bank would split into three single-phase manholes with a vault at each of the three landing locations inside which a phase of the underground cable would be spliced to the separated electrical phases of the submarine cable.

Northern HDD Transition

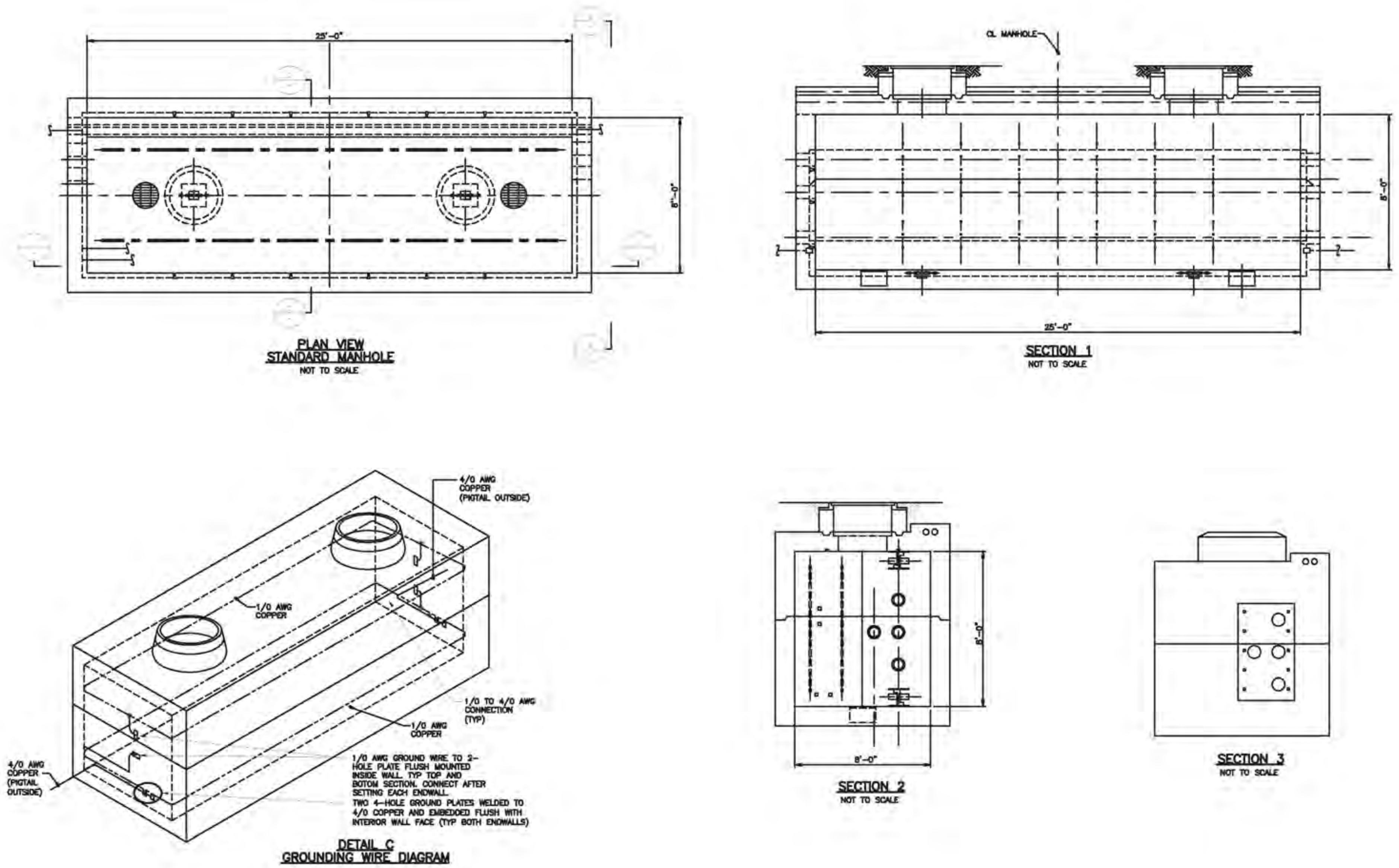
The HDD rig for the northern landing would be staged in the southeastern-most block of Spear Street, directly under or near the Bay Bridge; see Figure 4-8. This block of Spear Street is a cul-de-sac with no through traffic. The northern HDD transition to the bay would be steeper than the southern HDD transition. Water depth is near 80 feet about 850 feet east of Piers 28 and 30/32 and then slopes up steeply towards the seawall, climbing approximately 25 feet vertically over a 50-foot horizontal distance. Given this steep transition zone, the HDD installation would extend beyond the toe of this slope to locate the exit point within a flatter area. This extension should improve constructability and avoid potentially creating, or being affected by, bay floor stability problems in the area of the steep slope.

Southern HDD Transition

The HDD rig for the southern landing near Potrero Switchyard would be in 23rd Street, within the HDD entry pits and splice vault work zone depicted on Figures 4-9 and 4-10. This location would allow the submarine route to land north of the existing TBC transmission line. Water depth in the bay near the onshore portion of the HDD boring is less than 10 feet for the first 400 feet; it then gradually slopes down and levels off to a depth of approximately 35-40 feet about 1,500 feet from the shoreline.

Submarine Cable

The submarine cable system would continue the transmission line with one 230 kV-rated circuit using one single conductor cable per phase. Accordingly, the submarine portion of the transmission line would consist of three parallel cables (one for each phase of the circuit). Circuit ground wire and the communications cables would each be bundled with separate phase cables. The cables would have a minimum separation of approximately 33 feet in the shallower water areas and a maximum separation of approximately 150 feet in deeper water. Typically, submarine cables are separated from one another by a distance equal to two or three times the water depth to provide mechanical protection and facilitate any necessary repairs (p. 2-23 of PG&E, 2012a).



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Source: PG&E, 2012.

Figure 4-7
Typical Manhole

Expected and typical project submarine cable parameters are shown in Table 4-2. Along the northern HDD under The Embarcadero, the depth would be a minimum of 50 feet, which would be deeper than typical, to avoid the existing sewer collection/transportation box and the rock dike at the shoreline.

Table 4-2. Submarine Cable Parameters, Approximate Distances and Depths

Submarine Cable Component	Approximate Distance or Depth
Approximate Submarine Cable Route	2.5 miles
Maximum Sea Water Depth	80 feet
Typical Cable Burial Depth – Offshore	6–10 feet
Typical Cable Burial Depth – HDD	30 feet
Minimum Cable Burial Depth – Northern HDD at The Embarcadero	50 feet
Expected Minimum Cable Spacing – Offshore	33 feet
Expected Maximum Cable Spacing – Offshore	150 feet
Expected Minimum Cable Spacing – HDD	10 feet

Source: Table 2-2 of PG&E, 2012a.

Each of the submarine cables would be directly buried using a hydroplow into the bay floor to a depth of approximately 6 to 10 feet below the bay floor; see Figure 4-11 and 4-12. The water depth is less than 10 feet at The Embarcadero seawall between the piers. The water depth increases to 80 feet approximately 850 feet east of Piers 28 and 30/32, near the proposed northern HDD exit point. The water depth slopes gradually up to 35-40 feet at the southern HDD exit location.

An armored 2800 kcmil (1400 mm^2) cable with solid-dielectric copper conductor, XLPE insulation, and a lead sheath would be used to satisfy the project electrical loading requirements; see Figure 4-13.[2] The sizing is based on the typical HDD depth and conservative design parameters that may be finalized during detailed design.

4.10.2 Embarcadero 230 kV Bus Upgrade Project

The existing Embarcadero Substation is at the corner of Fremont and Folsom Streets in the Rincon Hill area. The substation is located inside a multi-story building clad in precast concrete architectural panels and constructed in 1974. A basement beneath the entire building plan is used for the medium voltage and existing 230 kV cable entries as well as the heating, ventilation, and air conditioning (HVAC) equipment. Electrical equipment within the Embarcadero Substation includes air-insulated buses, switchgear, and banks of 230/34 kV and 34/12 kV transformers. The substation is not tied into PG&E's 115 kV transmission network.

PG&E does not propose to modify the existing Embarcadero Substation as part of the project (PG&E's Response 4, PG&E, 2012b). No new substation work at Embarcadero Substation would be required beyond that already underway in a separate reliability project involving design changes and equipment replacement at Embarcadero Substation (the Embarcadero 230 kV Bus Upgrade Project).

PG&E would terminate the proposed Embarcadero-Potrero cable at the new gas-insulated switchgear currently under development as part of the Embarcadero 230 kV Bus Upgrade Project. PG&E's Embarcadero 230 kV Bus Upgrade aims to address reliability risks associated with the existing bus configuration

[2] Submarine cable sizes are expressed in square millimeters and English units according to the standards of the International Electrotechnical Commission (ICE).

Source: PG&E, 2012.

Figure 4-8
Embarcadero HDD Transition Area

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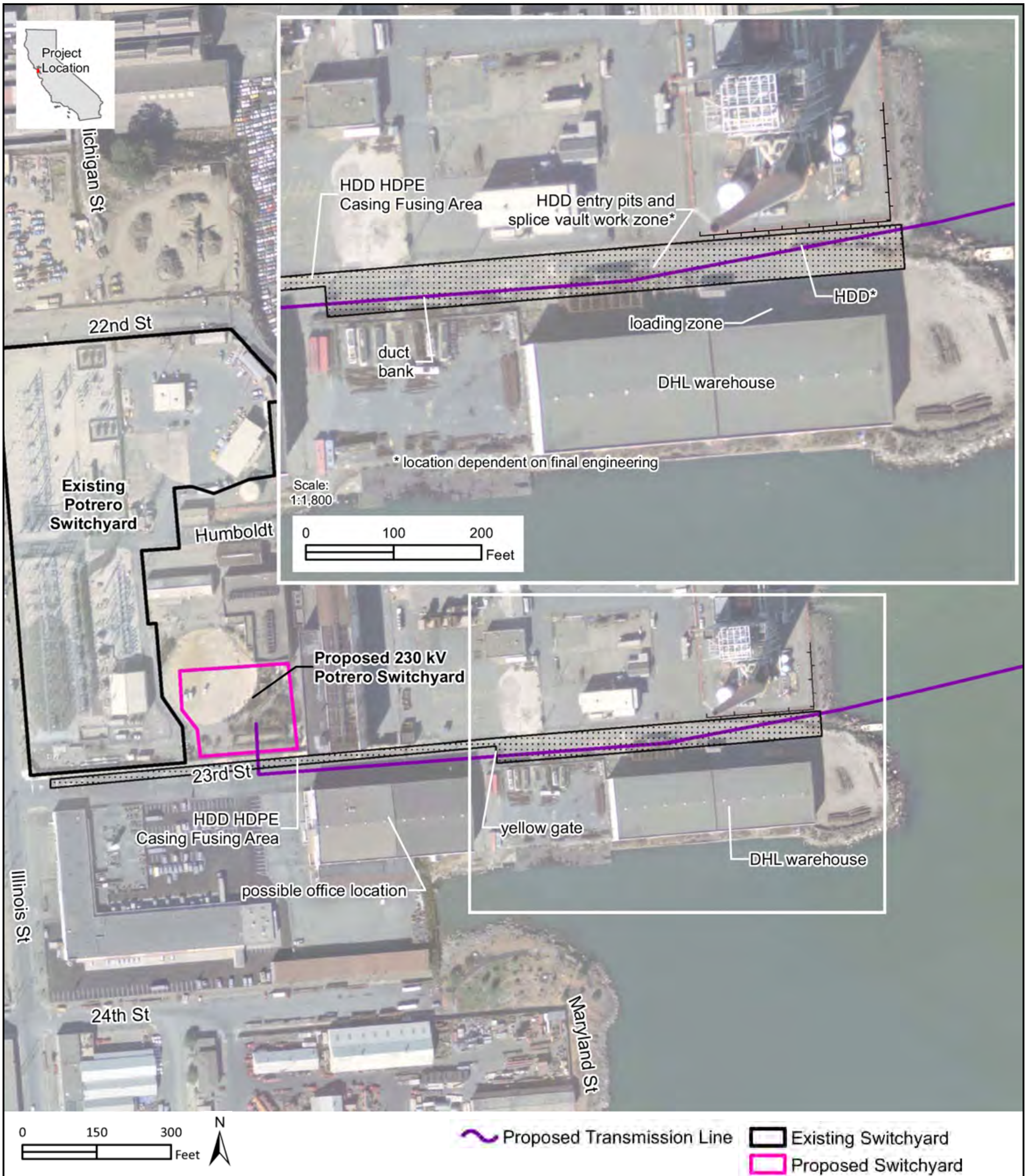

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Source: PG&E, 2012.

Figure 4-9
Potrero HDD Transition Area

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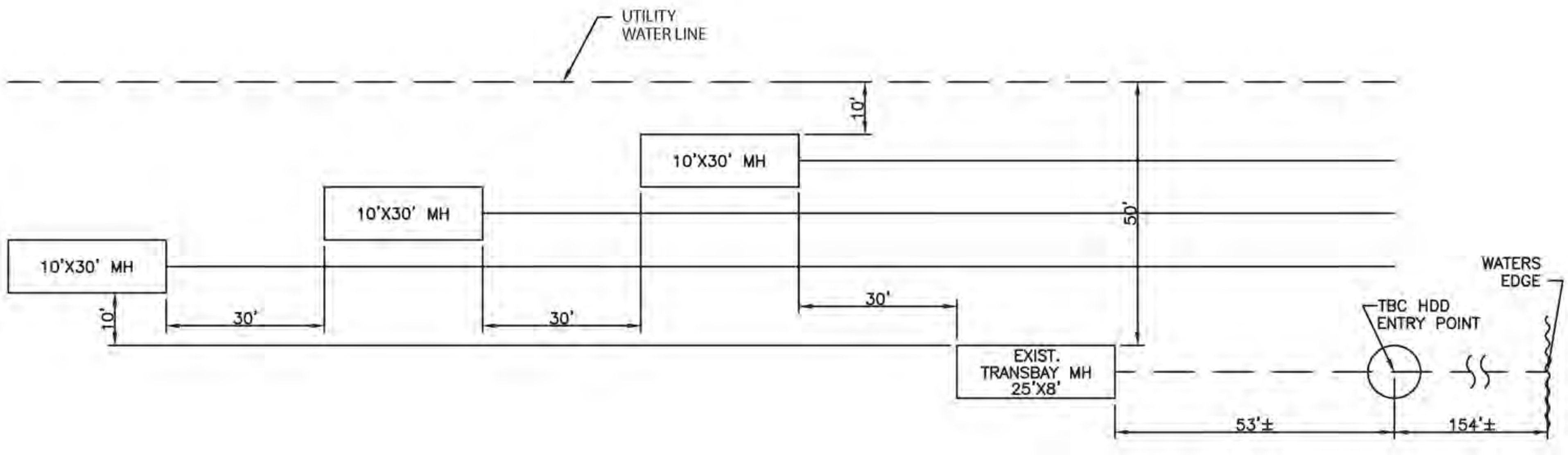

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Source: PG&E, 2012.

Figure 4-10

Southern HDD Transition Manhole Layout

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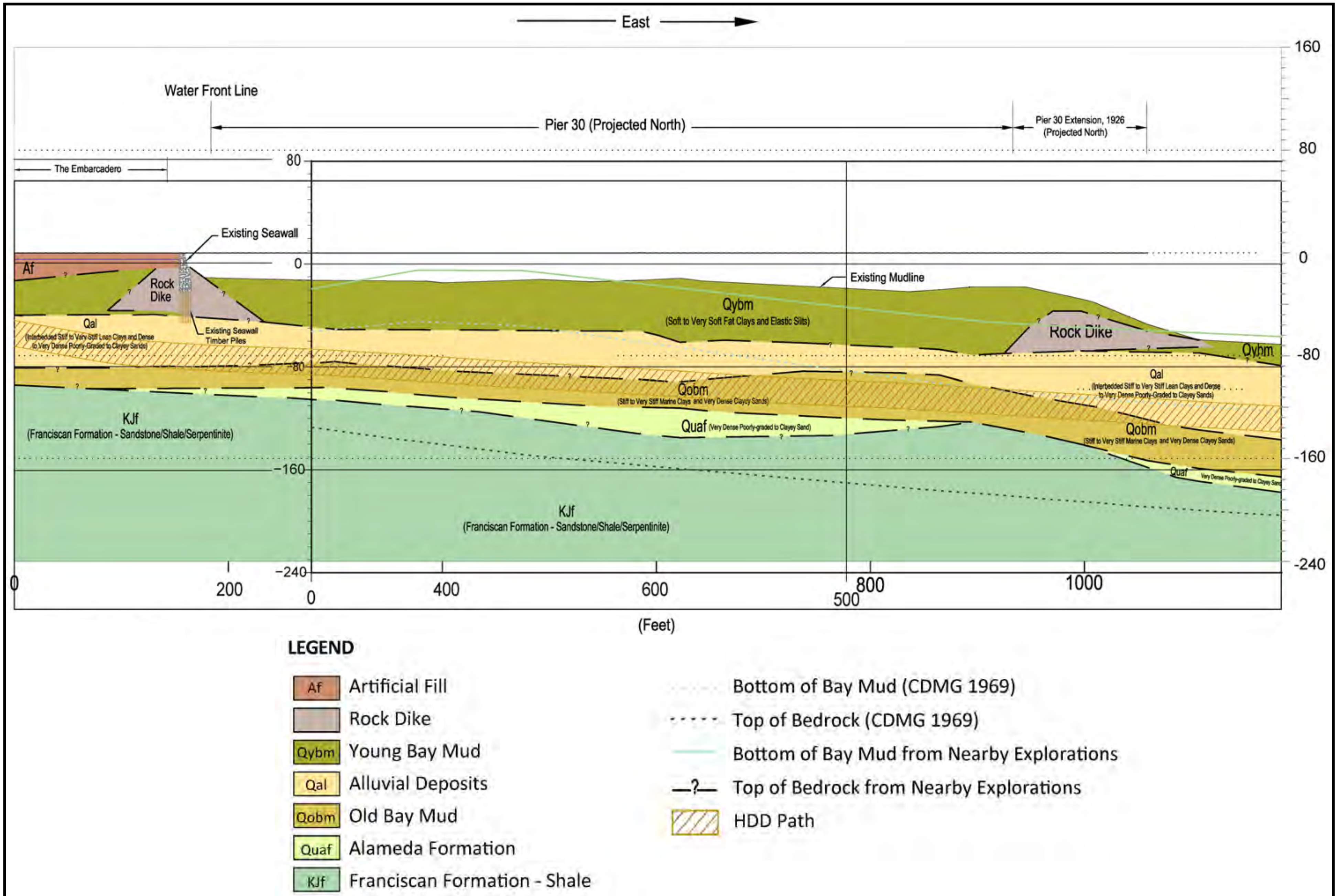

Source: PG&E, 2012.

Figure 4-11

Geologic Profile of North Transition from Land to Marine

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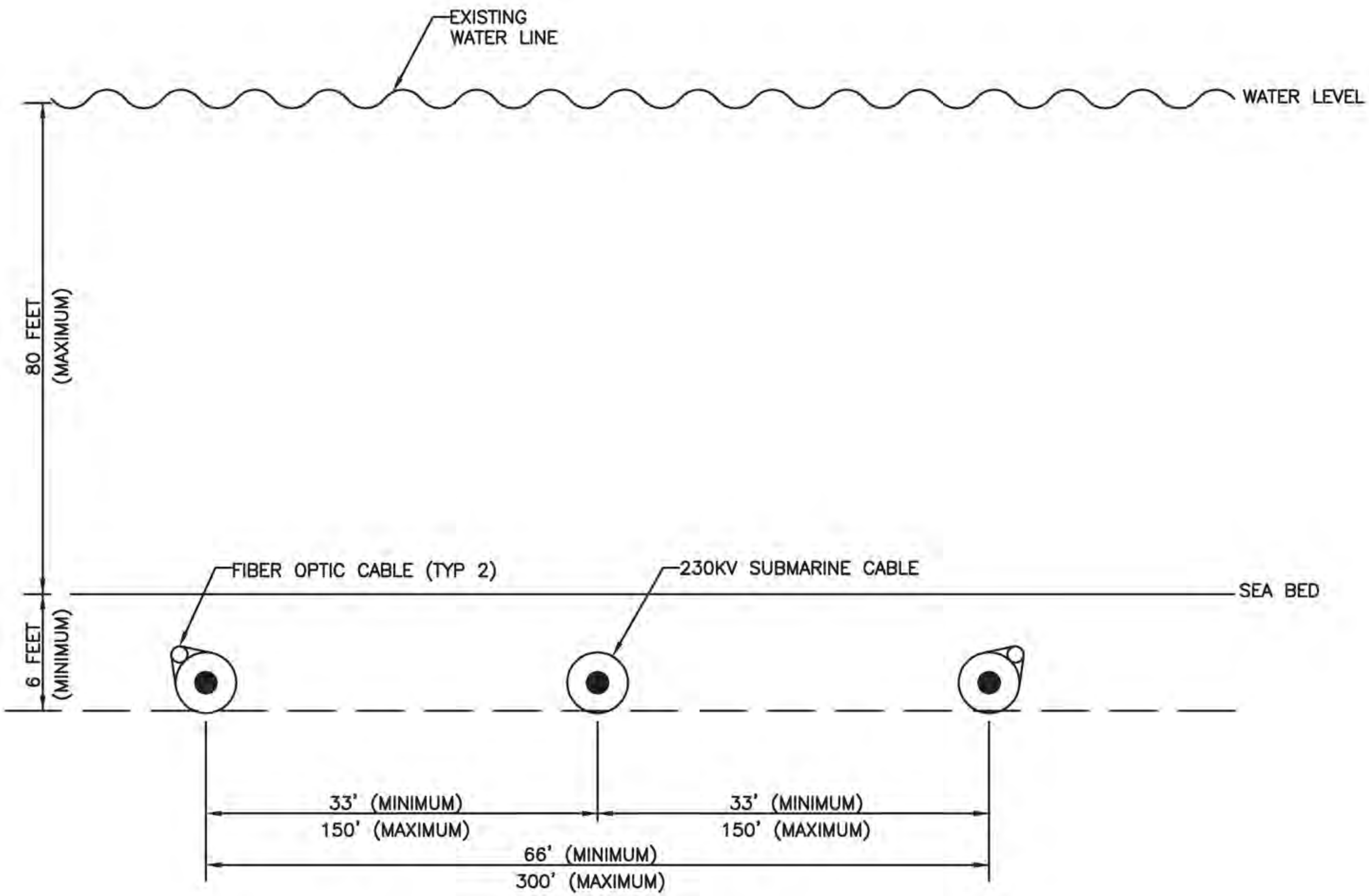

Source: PG&E, 2012.

Figure 4-12

Typical Submarine Cable Layout

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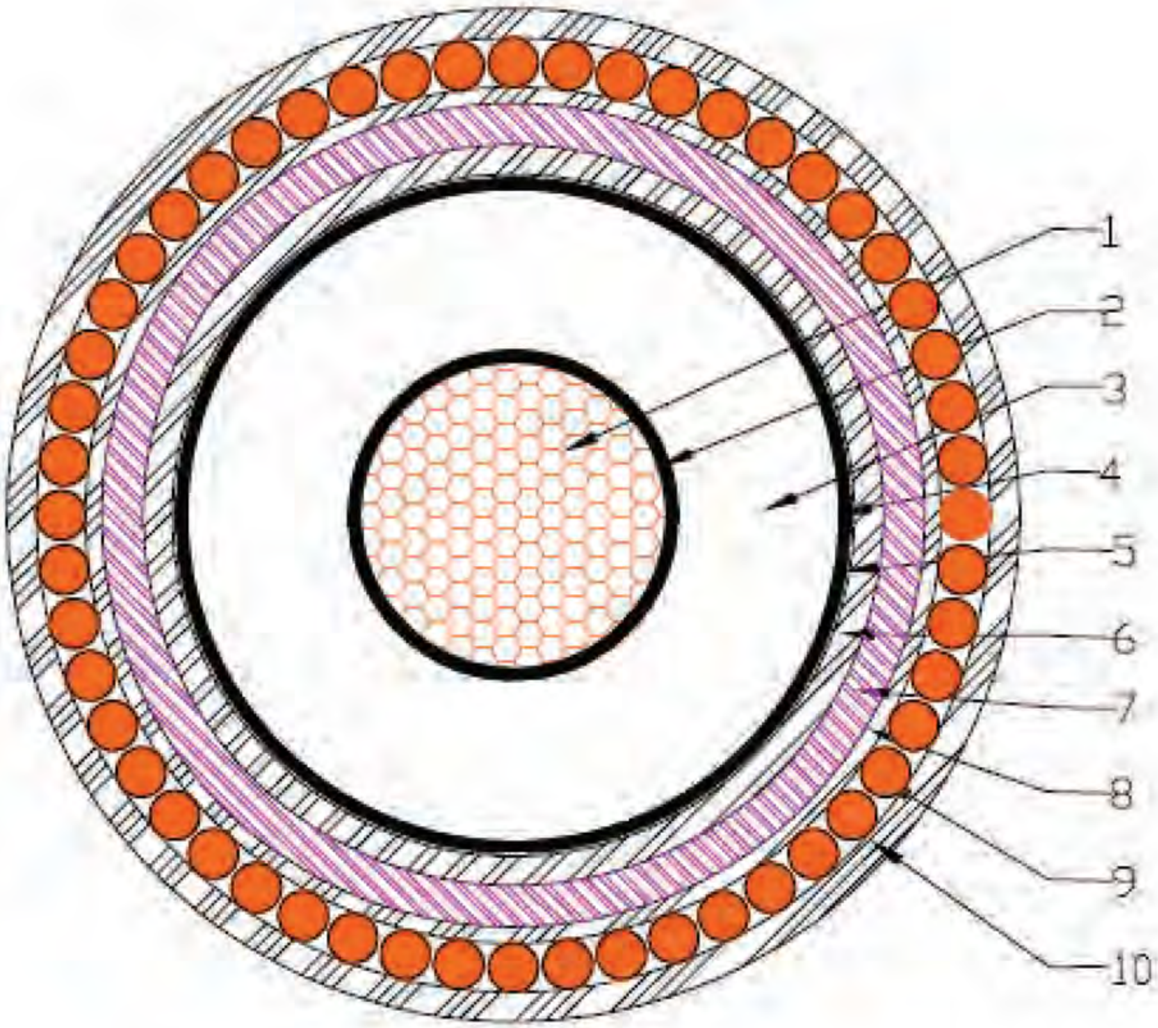

LEGEND

1. Water-blocked Conductor
2. Semi-conducting Conductor Screen
3. XLPE Insulation
4. Semi-conducting Insulation Screen
5. Longitudinal Water Barrier Layer
6. Lead Alloy Sheath
7. Black HD Polyethylene Sheath
8. Textile Bedding Layer
9. Copper Wire Armor
10. Polypropylene String Serving Layer

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Source: PG&E, 2012.

Figure 4-13

Cross Section of the Proposed 230 kV XLPE Submarine Cable

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by incorporating "breaker-and-a-half" configuration, where two main buses are connected through "bays" of three circuit breakers in series so that the failure of any one circuit breaker would not extensively interrupt power. If the new switchgear is delayed, until the Bus Upgrade is complete, PG&E would modify the substation bus inside the northwest corner of the existing Embarcadero Substation to allow temporary termination of the Embarcadero-Potrero cable.

PG&E expects to implement the bus upgrade whether or not the Embarcadero-Potrero 230 kV Transmission Project is approved as proposed (Advice Letter 4085-E, filed by PG&E July 17, 2012; effective August 16, 2012). The Embarcadero 230 kV Bus Upgrade Project was found categorically exempt from CEQA by CPUC in August 2012. As of January 10, 2013, the date that CPUC determined the application to be complete for the proposed Embarcadero-Potrero 230 kV Transmission Project, construction had not yet begun on the Embarcadero 230 kV Bus Upgrade.

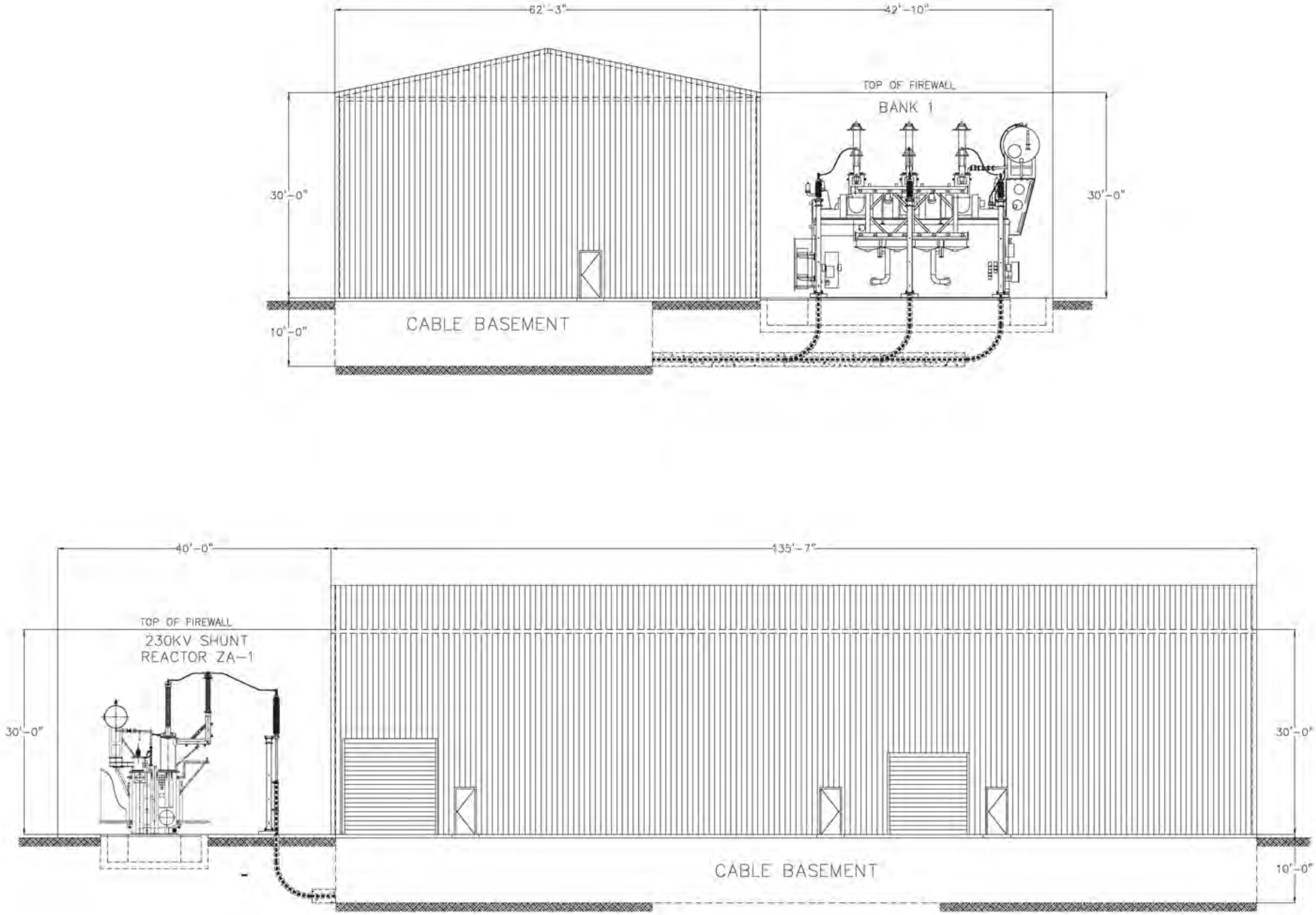
4.10.3 Potrero 230 kV Switchyard

The existing Potrero Switchyard is located on Illinois Street between 23rd and 22nd Streets in what is known as the Dogpatch neighborhood in the San Francisco Central Waterfront area. The facility is an open yard that operates as a 115/12 kV substation; however, for naming consistency, PG&E refers to the site as Potrero Switchyard. Currently, there is no 230 kV equipment at the existing Potrero Switchyard. To accommodate the proposed 230 kV cable, the project would include construction of a new 230 kV switchyard and 230/115 kV substation within about one acre on a parcel owned by GenOn Energy, Inc. PG&E would need to acquire this property through a fee simple transaction or condemn the property for utility use. The site is located on 23rd Street, adjacent to and east of the existing switchyard; see Figure 4-4.

Due to space constraints at the proposed site, the new 230 kV switchyard would feature gas-insulated switchgear (GIS) housed in an estimated 8,500-square-foot building with basement; see Figure 4-14. The switchgear, associated automation and control systems, and station service systems (i.e., AC power equipment to supply the building) would be inside. Up to 8,000 cy would need to be excavated and exported for the building basement and duct bank between the new switchyard building and the 115 kV buses at the south end of the existing Potrero Switchyard.

The proposed Potrero 230 kV Switchyard and GIS building area would require a site of approximately 41,200 square feet. Impermeable surfaces would include the building roof of approximately 8,500 square feet and concrete or paved outdoor equipment areas of approximately 10,000 square feet. Additionally, the remainder of the yard (approximately 23,000 square feet) would likely have a combination of gravel and concrete/asphalt surfaces. Preliminary foundation evaluation suggests deep-foundation systems may be needed for some of the structures within the new Potrero 230 kV Switchyard, including the GIS building (PG&E, 2013).

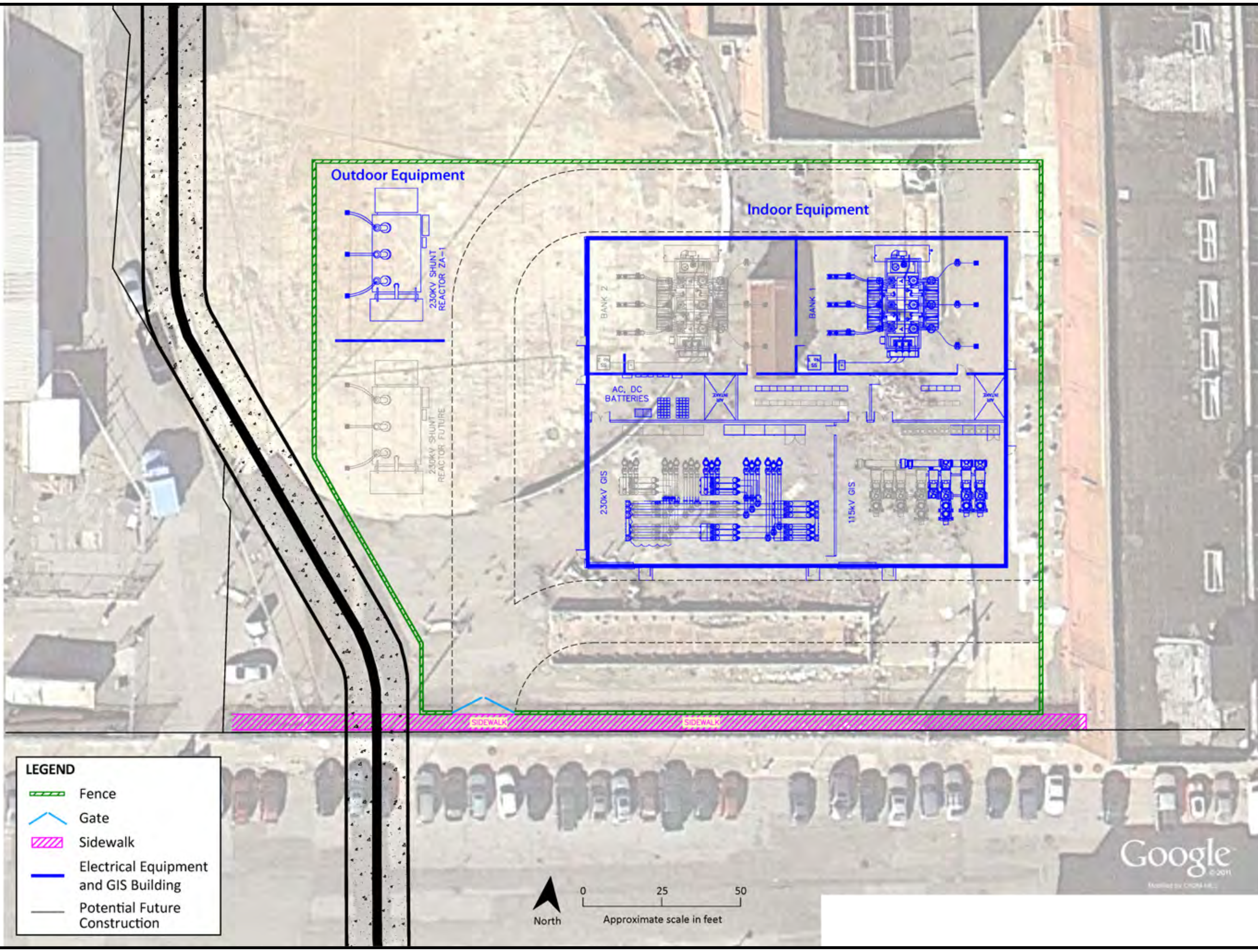
The basement of the new GIS building would contain electrical conduits, trays and cables to interconnect the electrical equipment on the main floor. The layout would include a spare bay with space for an additional 230 kV transformer and shunt reactor. Although there is no proposal for an additional 230 kV supply, ongoing studies, such as the CAISO San Francisco Peninsula Reliability Assessment (discussed in Section 1.5), may determine a need for a second 230 kV connection into Potrero Switchyard in the future. Duct banks to the existing 115 kV Potrero Switchyard and the proposed submarine cable would enter and exit the new 230/115 kV substation building via the basement; see Figure 4-15.



Source: PG&E, 2012.

Figure 4-14

Potrero Gas Insulated Switchgear Building Conceptual



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Source: PG&E, 2012.

Figure 4-15

230 kV Electrical Equipment

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The building height would be approximately 40 feet above grade to accommodate the GIS electrical equipment, and building dimensions would be approximately 136 feet by 62 feet. The building's cladding would be a light neutral color with a non-reflective finish (p.3.1-20 of PG&E, 2012a). Including the outdoor equipment, the new Potrero 230 kV Switchyard would cover an area of approximately 190 feet by 110 feet with added room for maintenance vehicle access. Outdoor equipment would be partitioned from the GIS building with firewalls. The proposed outdoor equipment includes one new 230/115 kV transformer, one new 230 kV shunt reactor, and their respective cable-to-air bushing connections. These would be shielded from the street by a new 10-foot-tall masonry wall around the perimeter of the new 230 kV switchyard. The perimeter wall would include a minimum of one 20-foot-wide access gate via 23rd Street, and the wall would be set back at least 3 feet away from the property line to allow for new landscaping. The gate in the brick wall that currently fronts Station A will be widened and the wall modified to allow adequate ingress, egress, and internal circulation access for large transformer equipment and future maintenance activities. Modification of discrete sections of the brick wall may include complete or partial removal.

Portions of the exterior yard areas that would not require Spill Prevention, Control, and Countermeasure (SPCC) oil containment may have some provisions for stormwater mitigation or control (such as pervious pavement, detention, and/or landscaping) depending on City building code requirements. Final design would be dependent on the results of the geotechnical investigation and possible chemical analysis of the site soil.

The existing SPCC/stormwater collection facilities at the Potrero 115 kV Switchyard (near the intersection of Illinois and 23rd Streets) would be utilized wherever possible and economically feasible. Storm water transport would be either by gravity flow (surface or piped), or pumping may be required depending on final hydraulic design. Small amounts of additional temporary water storage (500 to 1,000 gallons) may be utilized as part of the water transference system from the new 230 kV switchyard to the existing 115 kV switchyard area.

The proposed 230 kV switchyard would connect to the existing 115 kV switchyard through twelve underground 115 kV cables (i.e., two cables per phase per 115 kV bus); see Figure 4-16. The cables would be connected to the existing 115 kV switchyard using six single-phase tubular steel termination poles, approximately 10 feet high, with insulated terminals to a total height of approximately 17 feet. The new poles would likely be at the south end of the existing 115 kV bus, near 23rd Street. The height of the existing 115 kV bus structure is approximately 34 feet.

All new substation equipment, including cable terminations, would be seismically qualified to the High Level of Institute of Electrical and Electronics Engineers (IEEE) 693. The new 230 kV switchyard building would meet the requirements of the California Building Code (CBC).

4.11 Project Construction

This section includes an overview of the proposed construction methods and those typically used for construction of the underground and offshore portions of a 230 kV transmission line, and for work at Potrero Switchyard and Embarcadero Substation. This section includes discussion of the following:

- General construction considerations, including work areas;
- Traffic controls and lane closures;
- Staging areas;
- Easements and right-of-way;

- Underground transmission line construction;
- Substation and switchyard construction;
- Submarine cable installation, including installing the HDD transitions;
- Construction phasing; and
- Workforce and equipment.

4.11.1 General Construction Considerations

Other than staging, all onshore transmission line-related construction activities would be conducted in temporarily closed lanes along the project route. Lane closures would require additional detailed design and planning because city streets along the route would typically need to have one travel lane and one parking lane closed by PG&E during duct bank construction; see Section 4.11.2. Staging areas are discussed separately; see Section 4.11.3. Existing commercially available office and yard space may be used by contractors or agencies.

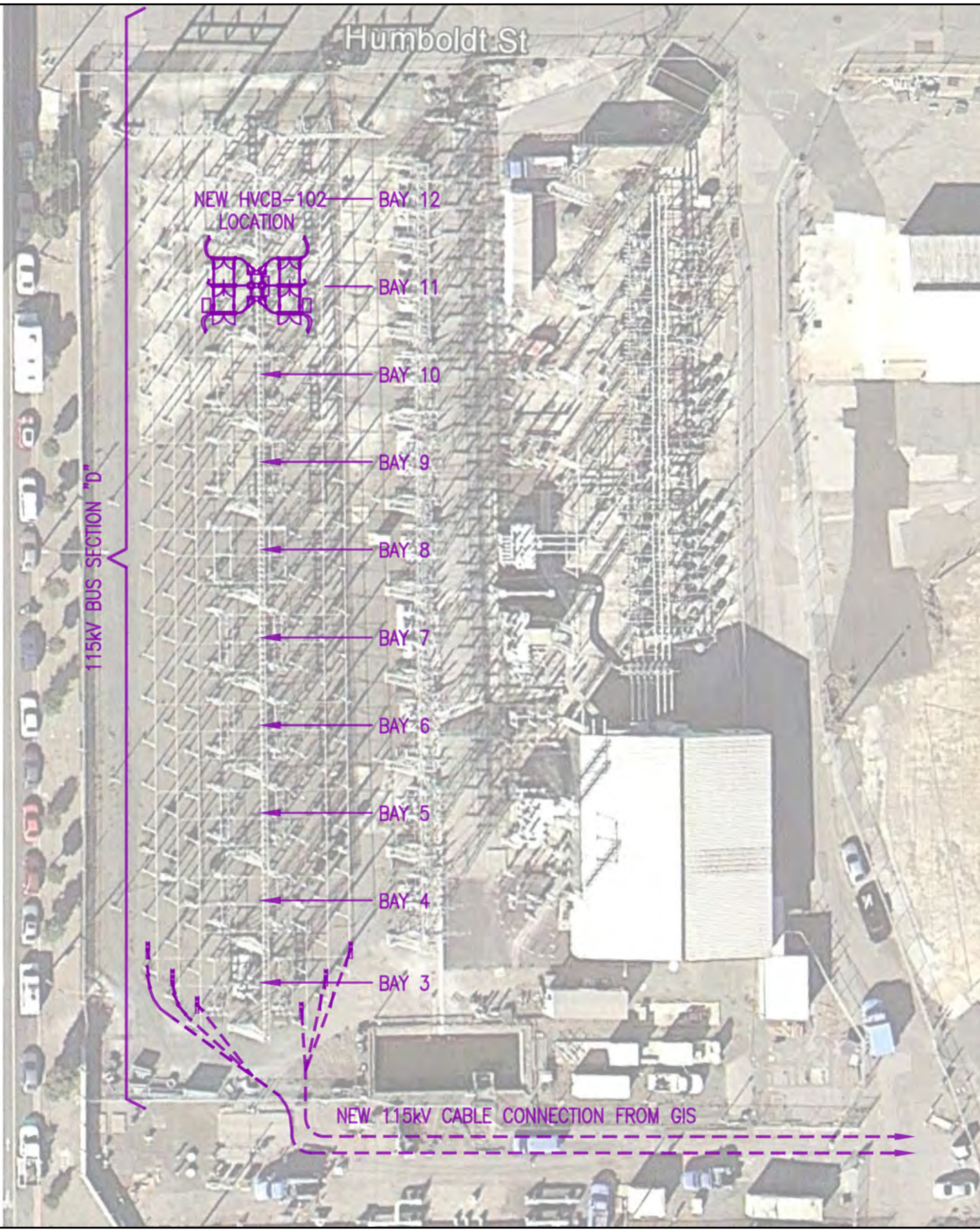
Work Areas

Trenching work areas would extend typically about 1,500 feet in length by 12 feet wide with work crews excavating and securing the trench walls via shoring. Once the shoring process is complete for approximately 500 feet, another crew would install the duct bank, and the trench would be backfilled and pavement restored. Approximately 150 feet to 300 feet of trench would be open at any one time. Staging and excavation for each vault would require approximately 1,500 square feet of work space. The sequential layout of the construction work area from the front end would include:

- 100 feet of traffic control taper/buffer zone;
- 500 feet of logistical work area for the trenching and trucking activities;
- 150 feet of trench excavation;
- 150 feet of conduit installation and backfilling;
- 300 to 400 feet of trench paving; and
- 200 feet of work area for temporary paving activities at the tail end of the construction operation.

Work areas for the HDD landing sites would be located in Spear Street and in 23rd Street. The work area for the northern HDD landing site would be approximately 500 feet by 60 feet at the Spear Street cul-de-sac, and the work area for the southern HDD landing site would be 800 feet by 50 feet along 23rd Street. An additional 800 feet of 23rd Street would be used for staging, which would extend the temporary lane closure and loss of parking between Illinois Street and the shoreline.

Cable pulling would occur after installing the underground conduits, pouring the concrete duct bank and backfilling the trench. Each cable reel and crew would require an area approximately 200 feet by 12 feet. Cable installation would occur between the southern onshore section termination at Potrero Switchyard and the Bay to land transition manholes on 23rd Street; between the northern onshore section termination at Embarcadero Substation and the Folsom Street manhole; and from that manhole to the Bay to land transition manholes at the Spear Street cul-de-sac. In conjunction with the area used by the reel trailer carrying the 12-by-6-foot-wide reels, the cable puller would also require an area approximately 100 feet by 12 feet wide.



Aspen Environmental Group

Source: PG&E, 2012.

Figure 4-16

Potrero Interconnection with 115 kV System

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Cable splicing procedures would typically require a single crew truck directly adjacent to each manhole. Actual splicing would occur within the buried manhole with aboveground support. The work area required for this activity is typically approximately 75 feet by 12 feet.

At work areas for trenching or HDD installation, electricity will be provided by portable “whisper-quiet” generators. The project would not require generators at the Potrero Switchyard construction area, nor at the connection to the Potrero 115 kV bus, as the old power plant station service line and/or existing distribution lines would be used as temporary power sources.

Dewatering and Groundwater Handling

Dewatering of the trench would be conducted using a pump or well points. Groundwater encountered during underground construction would be pumped into containment tanks and tested for turbidity and pH values. PG&E would discharge the pumped water into the storm sewer system when the water meets quality standards; otherwise, PG&E would dispose of it in accordance with state and federal standards.

Control containment and discharge could be performed in a variety of ways on site, such as by using holding tanks (e.g., truck trailer “Baker tanks”) that allow acceptable de-sedimentation prior to discharge. Other control containment and discharge methods could include pumping ground water directly to water trucks for haul off to a treatment facility, or with prior agreement and any necessary ministerial permits, discharge to a sewer. To discharge to a sewer, PG&E would prepare a special request for discharge and treatment of the estimated amount, as well as the cost of discharge, that would be submitted to the San Francisco Public Utilities Commission (SFPUC) Bureau of Environmental Regulation Management. Additionally, PG&E would need to obtain a water supply of approximately two 2,000-gallon truckloads per day for dust control during construction, likely through coordination with the SFPUC. The request for water supply and dewatering flows would be developed during final design (Section 2.6.2.2 of PG&E, 2012a; PG&E, 2013).

Excavated Materials

During construction, materials removed during trench excavation would be placed directly into trucks and removed from the area and disposed of off-site. The estimated total amount of materials to be disposed of is 6,000 cy for onshore trenches, duct banks, and vaults, 300 cy for the HDD pits, and 8,000 cy for the Potrero 230 kV Switchyard basement, for a project total of 14,300 cy. Materials that are used for construction of the underground conduits, such as concrete, plastic conduit, and asphalt, would be stored onsite during construction or at staging areas.

All excavated material would be removed from the site and hauled off to an appropriate landfill based on the pre-construction characterization of soils. Since numerous dump trucks would be required for the hauling operation, trucks would be staged for rotating hauling activities. Dust control and wet sweeping best management measures would be implemented during excavation.

Pre-characterization of soils would be completed prior to construction via soil borings throughout the route. The soil borings would be reviewed and characterized for proper disposal to a landfill that on a predetermined basis can accept the different classes of soil found at the project site. In addition, once construction commences, a site-specific hazardous waste manifest system would be used for each soil disposal truck. It should be noted that, to the extent feasible, all excavated material would be hauled off immediately and not be stored on- or off site. See also Section 4.13, Applicant Proposed Measures.

Vegetation Clearance

All onshore portions of the transmission line would be underground, and all work areas would be in city streets or paved areas. In the event that vegetation clearance is needed, disturbance would be minimized to that needed for safe access.

There are over 110 trees planted along the sidewalks that line the northern project route on The Embarcadero, Spear Street, and Folsom Street near the Embarcadero Substation. Depending on the precise location of the underground line (determined during final design), some of these trees may need to be removed or trimmed. One entire row of 18 sweetgum trees (2 to 3 inches in diameter and 10 to 15 feet tall) on Spear Street between Folsom Street and Harrison Street could potentially be trimmed or removed during construction (PG&E, 2013).

Temporarily disturbed areas would be restored to preconstruction condition once construction is complete. Any roots from trees and deep-rooted shrubs encountered during trenching or excavation would be pruned above the underground transmission line duct bank to avoid interference.

Erosion Control and Pollution Prevention

PG&E would prepare and implement an Erosion and Sediment Control Plan as part of a Stormwater Pollution Prevention Plan (SWPPP) that would be prepared for the Proposed Project. Erosion control and pollution prevention measures in the SWPPP would address elements such as track-out controls, stockpile handling, dewatering discharge, drain inlet protection, and replacement of any disturbed pavement or landscaping.

Cleanup and Post Construction Restoration

The Proposed Project would occur in areas that are either paved, landscaped, or graveled, such as at the existing Potrero Switchyard and the affected portions of GenOn property. Restoration would consist of removing the construction equipment and materials and repaving, restoring landscaping, or recovering with gravel or depending on the original condition of the site.

All work areas, whether vegetated or not, would be restored to conditions equal to or better than preconstruction conditions. Vegetated areas disturbed by the project could include limited street or landscaped areas that would be replanted per agreement with the City or landowner. As part of the final construction activities, PG&E would restore all removed curbs, gutters, street surfaces, and sidewalks, repave all removed or damaged paved surfaces, restore landscaping or vegetation as necessary, and clean up the job site.

Trash and litter at the job site would be collected in bins or appropriate containers easily accessible to construction crews and removed to the staging areas for off-haul to the appropriate solid waste facility. PG&E expects to characterize soils for disposal in-situ, and spoils and asphalt/concrete waste would be hauled off for appropriate disposal following characterization. All hazardous materials and hazardous wastes would be handled, stored, and disposed of in accordance with all applicable regulations, by personnel qualified to handle hazardous materials.

4.11.2 Traffic Controls and Lane Closures

All lane closures would be identified in more detail by a Traffic Management Plan that PG&E must develop in consultation with the City (Section 2.6.1.2 of PG&E, 2012a). The City would likely require a full lane of pavement restoration which in turn would require a two lane closure over a 1,500 foot work area. PG&E

would apply for a Special Traffic Permit from the San Francisco Municipal Transportation Agency (SFMTA). PG&E would submit a Traffic Management Plan as part of this application. For the short-term closures of underground transmission line construction, appropriate traffic controls would be implemented during trenching and during vault installations. Traffic controls would include but not be limited to typical traffic control cones, candles, electronic signage board and temporary fixed warning signs for workmen prior to work zone in both directions, and/or Type III barricades, as specified in the Special Traffic Permit from the City of San Francisco. PG&E expects most work in temporarily closed lanes would be in franchise along the onshore portion of the route. Overall, lane closures would generally extend along one city block, or potentially portions of two blocks where working near an intersection, at any given time. However, exact lane closures can only be determined following detailed investigations into existing utilities and final construction planning. No new access roads would be developed for this project.

PG&E would also apply for a ministerial Excavation Permit from the San Francisco Department of Public Works (DPW) to allow trenching from the two landings through franchise to PG&E's properties at the transmission line termination points. The Transbay Joint Powers Authority and San Francisco Planning Department have no independent permitting jurisdiction relative to the Proposed Project. However, the Transbay Joint Powers Authority and SFMTA would be involved during review of PG&E's Traffic Management Plan, where relevant for the Special Traffic Permit.

PG&E would coordinate provisions for emergency vehicle and local access with City personnel. PG&E's coordination with emergency responders would occur prior to construction and during the construction phase. PG&E proposes to coordinate daily with all first responders to exchange information regarding the locations of crews and work areas. Additionally, for trenching in areas where access is needed crossing the trench line, steel plates would be on hand and immediately placed to provide access for the needed response.

4.11.3 Staging Areas

Onshore Staging

In addition to the use of closed lanes for underground work areas, PG&E expects that onshore staging for the Proposed Project would occur in one or more of three possible staging locations, and along 23rd Street, as follows:

- Staging Alternative 1 would be located on GenOn property north of 23rd Street east of Illinois Street, to the north of the proposed Potrero 230 kV Switchyard. The L-shaped area is approximately 0.9 acres extending north of the proposed switchyard construction work area, comprising of two rectangular shaped areas approximately 215 feet by 60 feet and 170 feet by 140 feet.
- Staging Alternative 2 would be located on GenOn property in a paved area to the east of the proposed Potrero 230 kV switchyard. The L-shaped area is approximately 1.5 acre, comprising of two rectangular shaped areas approximately 325 feet by 140 feet and 90 feet by 220 feet.
- Staging Alternative 3 would be located on Port of San Francisco property on Amador Street near Cargo Way. It is a rectangular paved area, with an estimated area of approximately 2.3 acres (430 feet by 230 feet).

Figure 4-5 illustrates the potential locations for staging onshore activities. In addition, PG&E or agency contractors could decide to use commercially available office or yard space in San Francisco and the Port of Oakland to base their operations; any such existing office or yard space will have already been subject to city permitting requirements.

HDD staging would occur along 23rd Street and in the public street. This area would be used for all pipe fusion and pipe casing work to stage both the northern and southern HDD. The work area in 23rd Street would extend to the water's edge, where fused sections of the HDPE conduit would be connected to a small boat, floated, and tugged to the points of each HDD exit (PG&E, 2013).

The proposed HDD staging site along 23rd Street (Figure 4-9) would be approximately 1,600 feet in length by 20 feet wide. Approximately half or 800 feet of the staging area would be located in the public street, and would result in the temporary loss of street parking for 70 spaces. The remainder of the closure along 23rd Street would be 800 feet by 50 feet for the southern HDD landing work area.

Submarine Work Staging

Crews for submarine work would 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 the project vessels. PG&E has not proposed any specific anchoring points or locations for staging the marine crews. Given that anchoring locations vary each day based on local ship traffic, project-related vessels and barges would be directed daily regarding anchoring locations via the Vessel Traffic Service of San Francisco and the U.S. Coast Guard.

4.11.4 Easements and Right-of-Way

The onshore portions of the project, including the two HDD termination points, would be located primarily in franchise in city streets or PG&E-owned property with the exception of a portion of the southern landing area. At the northern landing area, the line would pass through City streets and areas owned by the State of California (Caltrans, for the portion under the Bay Bridge). The portion of the submarine route in the San Francisco Bay would require a license from the Port of San Francisco.

The southern landing location at 23rd Street would require approximately 38,000 square feet of right-of-way acquisition from the shoreline to a gate located approximately 760 feet west from the shoreline. In addition, the Potrero 230 kV Switchyard site would need to be acquired in fee simple or by condemnation from landowner GenOn, and a License would need to be obtained from the Port for use of Port property (Section 2.5 of PG&E, 2012a).

Temporary Construction Easements 50-feet wide and permanent easements would be negotiated by PG&E and acquired from private property owners. PG&E indicates that all private property is in Port's jurisdiction. Two sections of the cable are in private property. The first is in the DHL facility at 401 23rd Street. The DHL parcel extends 760 feet from the shoreline to the franchise area. Both a temporary and a narrower permanent easement would be required in that area.

The second piece of the cable route in private property is approximately 100 feet long connecting the proposed Potrero 230 kV Switchyard to the proposed cable in franchise in 23rd Street. This property would be part of the switchyard acquisition from landowner GenOn. A portion of cable route that extends approximately 400 feet appears to be outside the Port's jurisdiction but is within franchise in 23rd Street.

4.11.5 Underground Transmission Line Construction

This section describes the proposed construction methods for construction of the underground transmission line. Installation of the underground transmission line, duct banks, and splice vaults would be completed using a cut-and-cover method (open trenching) along the majority of the route. The major underground construction activities would begin with vault installation, followed by trenching and duct bank installation, and, finally, cable installation.

4.11.5.1 Trenching/Duct Bank Installation

Prior to trenching, PG&E would notify other utility companies (via the Underground Service Alert [USA]) to locate and mark existing underground structures along the proposed alignments, and also would conduct exploratory excavations (potholing) to prove the locations for proposed facilities as needed. PG&E would apply for a ministerial Excavation Permit from the City for trenching in City streets. No complete long-term road closures would be expected during trenching, although one-way traffic controls as well as short-term road closures up to 1,500 feet would be necessary to allow for certain construction activities and to maintain public safety.

After the route is marked, the pavement within the trenchline would be removed. Trenching activity requires one work crew progressively excavating, hauling off material, and backfilling. Upon reaching final trench excavation depth, a second work crew secures the trench walls via shoring. Once the shoring process is complete, a third installs PVC conduit to provide a raceway for the electrical cable. Upon completion of PVC conduit laydown, the trench is backfilled and the trench alignment temporarily paved. This progression would continue between each HDD transition area and the points of termination at Embarcadero Substation and Potrero Switchyard. Final roadway restoration and asphalt paving would be completed once the cable is fully installed, tested and released to operations. This to avoids having to break the final pavement to replace any section of cable should it failed during testing.

Trenching would progress at an approximate rate of 50 feet per day. The length of open trench at any one time would typically be 150 feet to 300 feet on any street, depending on the City's permitting requirements. Steel plating would be placed over the trench to maintain vehicular and pedestrian traffic across areas that are not under active construction. Traffic controls would also be implemented to direct local traffic safely around the work areas (see Section 4.11.2). The total surface of the trench plates over backfilled areas would vary between approximately 100 to 500 feet in length each day until it has reached a surface large enough (typically 300 feet) for temporary pavement restoration. Trench paving would likely occur once a week to minimize the amount of trench plates on the road.

As the trench for the underground 230 kV cable is completed, PG&E would install PVC cable conduits and concrete encasement duct bank. The duct bank cover would measure at least 36 inches. The typical dimensions of a single circuit reinforced duct bank are approximately 3 feet 7 inches wide by 3 feet 4 inches deep, although typical dimensions may vary depending on soil stability and the presence of existing substructures (Figure 4-6). The trench would be widened or shored where needed to meet California Occupational Safety and Health Administration (OSHA) safety requirements.

Where the electrical transmission duct bank would cross or run parallel to other substructures (which have operating temperatures at earth temperature), a minimum radial clearance of 12 inches would be required. These substructures include gas lines, telephone lines, water mains, storm lines, and sewer lines. In addition, a 5-foot minimum radial clearance would be required where the new duct bank crosses another heat-radiating substructure at right angles. A 15-foot minimum radial clearance would be required between the duct bank and any parallel substructure whose operating temperature significantly exceeds the normal earth temperature. Such heat-radiating facilities may include other underground electric transmission circuits, primary electric distribution cables (especially multiple-circuit duct banks), steam lines, or heated oil lines.

PG&E would identify utilities during final design, evaluate their proximity and potential for induced current and/or corrosion, and in coordination with the utility-system owner, determine whether steps are necessary to reduce the potential to induce current or cause corrosion. PG&E would take the necessary steps in coordination with those utility system owners to minimize any potential effects through measures, such as increased cathodic protection or utility relocation. The steps are summarized as follows:

- During final design, prepare study of corrosion and induced currents.
- Send results of study to each affected utility system owner for review and comments.
- Owners submit requirements for protection of each of their facilities.
- PG&E makes changes accordingly or compensates owner for future protection measures, per the owner's preference.

Once the PVC conduits are installed, thermal-select or controlled backfill would be transported, placed, and compacted. A road base backfill or slurry concrete cap would be installed, and the road surface would be restored in compliance with the City permits. While the completed trench sections are being restored, additional trenchline would be opened farther down the street. This process would continue until the entire conduit system is in place.

All backfilling material would be engineered material called flowable thermal concrete (FTC), and flowable thermal backfill (FTB). Each has unique properties specific to its application, while both are designed to have thermal characteristics for heat displacement. For a typical trench, the bottom 2 feet encases the PVC conduit with FTC, while the remainder of the trench would be filled with City-approved "diggable control density fill" FTB to the roadway sub-base level. From that point, all restoration would be based upon matching the street's existing sub-base and surface, i.e., asphalt, concrete, or combination of the two. The excavated material would not be used as backfill (see Section 4.11.1, Excavated Materials). The estimated total amount of excavated materials to be removed for trenches, duct banks, and vaults is 6,000 cy.

The total duration of trench excavation and manhole installation, not including cable pulling and HDD operations, is estimated to take approximately four months along the northern underground segment, and two months along the southern underground segment. Cable pulling, discussed in Section 4.11.5.3, is a standalone operation that would be performed after the vaults are installed, the duct bank is fully poured, and the trench back-filled and temporarily paved. Final paving restoration would be scheduled after the cable is fully installed and operative. The San Francisco paving permit would likely require a full lane of pavement restoration which in turn would require a two lane closure over a 1,500 foot work area. Final paving would take 5 days along Spear and Folsom Streets and 2 days on 23rd Street.

Equipment necessary for trenching in closed lanes and HDD work areas include pavement saw cutting equipment, pavement grinder, excavators, and dump trucks. Pavers would be used for restoration. (PG&E, 2013). Section 4.11.9 lists all equipment expected to be used during construction. PG&E expects 4 dump trucks to be used to haul trench and excavation materials and import backfill to the project. The number of daily total haul truck trips would depend upon the rate of the trenching, which is estimated to progress at an approximate rate of 50 feet per day over 6 months. Jackhammers would be used when needed to break up sections of concrete that the saw-cutting and pavement-breaking machines cannot reach. Other miscellaneous equipment would include a concrete saw, various paving equipment, and pickup trucks (see also Section 4.11.9). In general, no equipment would be left at the trench site overnight, with the exception of an excavator.

4.11.5.2 Vault Installation

The typical complete pre-cast vault installation would take 4 to 7 days, working 10 hours per day from breaking ground to finishing grade. For each vault, the excavation would be approximately 34 feet long, 14 feet wide and up to 15 feet deep. Excavation for vaults of this size would require shoring components such as driven sheet piles, or slide rail steel sheeting. Once the initial excavation and shoring is installed, preparation of the sub-base would consist of the installation of crushed rock for leveling purposes. If present, groundwater would be tested and either pumped out to a controlled containment or discharged as would occur during trenching.

Once the vault preparation steps (excavation, shoring and finish grade leveling) are completed, setting the vault is performed via sectional lifts of the three vault pre-cast sections using either a hydraulic or a lattice type crane. With all sections of the vault set in place, backfilling can start as the shoring is removed.

Lane closures would be required at each vault location according to the following sequence:

1. Vault installation would be a stand-alone operation performed prior to trenching/duct bank installation, which would require a 4- to 7-day lane closure period for each vault.
2. Conduit cleaning/proofing would be performed after the duct bank is completely installed and backfilled. It requires a 2-day lane closure period.
3. Cable pulling would require a 2-day lane closure period per cable phase (6 total days of lane closure).
4. Racking/splicing would require 2 to 3 days at the landing single phase vaults and 7 to 9 days at the Folsom Street three-phase vault.

While the estimated total lane closure at each vault is 20 days, conduit cleaning/proofing, cable pulling and racking/splicing can only be sequential for a total of 13 days sustained closure at a single vault location.

The major equipment required for vault installation would consist of an excavator, pickup trucks, end dump trucks, stake trucks for material, 75-ton crane, crane riggers truck, tractor trailers for sheet piling delivery, tractor trailers for delivery of precast concrete manhole sections, and possibly water trucks and/or containment water tanks (see also Section 4.11.9).

4.11.5.3 Cable Pulling, Splicing, and Termination

The proposed cable system would consist of three major components: the cable, splices that connect cable sections, and terminators that connect the cable to the equipment at the substations. Cable installation would occur after the underground vaults, duct banks and HDDs are installed.

Cable Pulling

The cable for the Proposed Project would consist of three individual cables (one per electrical phase) and a communication fiber optic cable. Pulling between two vaults typically would take approximately 2 to 3 days, working 10 hours per day. To pull each cable through the duct bank, a cable reel would be placed at the end of a duct bank section in a vault, and a pulling rig would be placed at the other end of the duct bank section in another vault. With a small rope called a "fish line," a larger rope would be pulled into the duct. The large rope would be attached to pulling eyes on a conductor end, and the large rope would pull the conductor into the duct. To ease pulling tensions, a lubricant would be applied to the conductor as it enters the duct. The three electric phases and one communication cable would be pulled through their individual ducts at the rate of two of the three sections between vaults per day.

Cable Splicing

Prior to starting the actual splicing, the vaults would be outfitted with steel racks that would ensure the cable splices are securely affixed to the vault's inner walls. A splice trailer would be positioned adjacent to the vault manhole openings, and a mobile power generator would be located directly behind the trailer. The vaults must be kept dry twenty four hours per day to prevent water or impurities contamination of the unfinished splices. Racking and splicing is estimated to take 2 to 3 days at each landing single-phase vault and 7 to 9 days at the Folsom Street three-phase vault.

Cable Termination

At the southern end of the route, the cable would continue underground into the new Potrero 230 kV Switchyard building basement where it would terminate. At the northern end of the route, the cable would continue underground into the building of the Embarcadero 230 kV Bus Upgrade. Terminating the cable at the substations would take approximately 7 days at each end.

4.11.5.4 Jack and Bore or Microtunneling Construction

Jack and bore or microtunneling construction methods would be used if traditional open trenching cannot be used or existing utilities must be avoided in certain underground locations. Where the submarine to underground transition occurs, the trenchless construction method would be HDD, as described further in Section 4.11.7.3, Submarine to Land Transitions.

If a jack and bore segment must be used for a segment of underground cable installation, a casing would be advanced into the soil while the soils are removed by an auger rotating inside the casing. A steel casing would be used initially while the hole is being drilled to be replaced by a final casing. To minimize power losses from magnetic induction, the final casing would normally be made of nonmagnetic materials such as a fiberglass-reinforced polymer mortar. The internal PVC conduits would then be installed in the casing using plastic spacers to keep the conduits separated. The annular space between conduits and casing would then be filled with thermal grout.

Microtunneling would use a remotely controlled boring machine combined with the pipe jacking technique to directly install cable underground as an alternative to avoid having long stretches of open trench. Typical microtunnel equipment would include the boring machine, a hydraulic jacking system to jack the conduit, a closed loop slurry system to remove the excavated tunnel spoil, a slurry cleaning system to remove the spoil from the slurry water, a lubrication system for the exterior of the conduit during installation, and a guidance system to provide installation accuracy.

4.11.6 Substation and Switchyard Construction

4.11.6.1 Potrero Switchyard

Potrero Site Preparation

Activities needed to prepare the Potrero Switchyard for construction of the new 230 kV switchyard and 230/115 kV substation would include contractor equipment and personnel mobilization, utility locations, surveys, and similar construction support. Construction areas would be delineated, including the affected portions of the GenOn site, the existing switchyard, and the staging area. Public safety systems (fencing, signage, etc.) would be put in place as part of final preparations before beginning construction work.

Soil contamination is known to exist at the proposed switchyard location. The extent of soil removal necessary would be determined prior to mobilization, with the preliminary estimate being less than 8,000 cy for this site. Excavation, soil export, and import activities would be completed before below-grade construction activities begin. Adequate laydown space would be prepared to receive materials required for initial construction activities at the GenOn site and at the staging areas (see Section 4.11.3).

Potrero 230 kV Switchyard Building and Perimeter Fencing

Developing the switchyard building and completing the basement would involve constructing the building and developing site access on 23rd Street. The new switchyard would be prepared for the installation of the transformers and shunt reactor.

Preliminary foundation evaluation by PG&E suggests deep-foundation systems may be needed for some of the structures within the proposed Potrero 230 kV Switchyard, including the GIS building (PG&E, 2013). Construction of the GIS building basement and its foundation system may require sloped-excavation or earth-retention around the perimeter of the basement excavation. Final determination would be made after the geotechnical investigation. If an earth-retention system is required for basement construction, vertical elements of the following types may be used: drilled or inserted soldier beams and timber lagging; continuous drilled piers (tangent or secant); or sheet piles. Determination of shoring type would be highly dependent on subsurface materials encountered during the geotechnical investigation and the depth of groundwater (PG&E, 2013).

The foundation support at the new Potrero 230 kV Switchyard, including sheet piles or any other vertical elements, would be built using a non-pile (hammer) driving method, such as the Tubex grout injection method. The Tubex grout injection method uses a drill table to force a pile into the ground, then grout is injected under high pressure into the soil, a reinforcing cage or dowels are placed, and the pile is filled with concrete. This method minimizes vibration and noise, and no soil removal would be required for installing the foundation support, since the grout would be injected into the native soil. Design and final selection of these elements would be based on both the final geotechnical recommendations and the results of competitive bidding by specialty contractors qualified to perform shoring installation.

Interconnection of the 115 kV/230 kV System

Following development of the new switchyard building, PG&E would establish a new 115 kV connection between the new 230 kV switchyard and the existing Potrero Switchyard. A duct bank would be constructed from the new switchyard building to the two existing 115 kV buses at the south end of the existing Potrero Switchyard. The work would require coordination with existing underground features inside the switchyard property.

Existing Potrero Switchyard Modifications

Modifications to the existing Potrero Switchyard would include installing six tubular steel termination poles to transition the 115 kV cables from the new switchyard and duct bank and to connect to the existing 115 kV buses. Relocation of existing circuit breakers and other equipment would be necessary to secure adequate space to install new high voltage cable terminations, switches, and related structures.

Equipment Installation and Testing

Equipment installation would begin following completion of the switchyard building. The conceptual building design would provide for multiple installation functions to proceed concurrently. Cabling and equipment testing could take place alongside assembly work. Much of the cable installation work at the switchyard building would take place in the basement vault beneath the equipment.

Cable Connection, Energizing, and Commissioning

With the previous steps complete, the new 230 kV cables would then be connected into the new switchyard and substation equipment. Energizing and final testing would then take place. Immediately following termination and testing, the cables may be energized and final switchyard tests performed. The switchyard may be commissioned and tests associated with the interconnection with Potrero Switchyard completed; alternatively, in the event the Embarcadero-Potrero 230 kV cable is not available for use, 115 kV power could be sourced from Potrero Switchyard for testing the new 230 kV switchyard equipment.

Spill Prevention, Control, and Countermeasures

PG&E would prepare a Spill Prevention, Control, and Countermeasure (SPCC) Plan for the new Potrero 230 kV Switchyard, which would specifically describe the containment of equipment containing more than 50 gallons of oil. PG&E proposes local containment for the new 230 kV transformer and reactor. The SPCC Plan would 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.

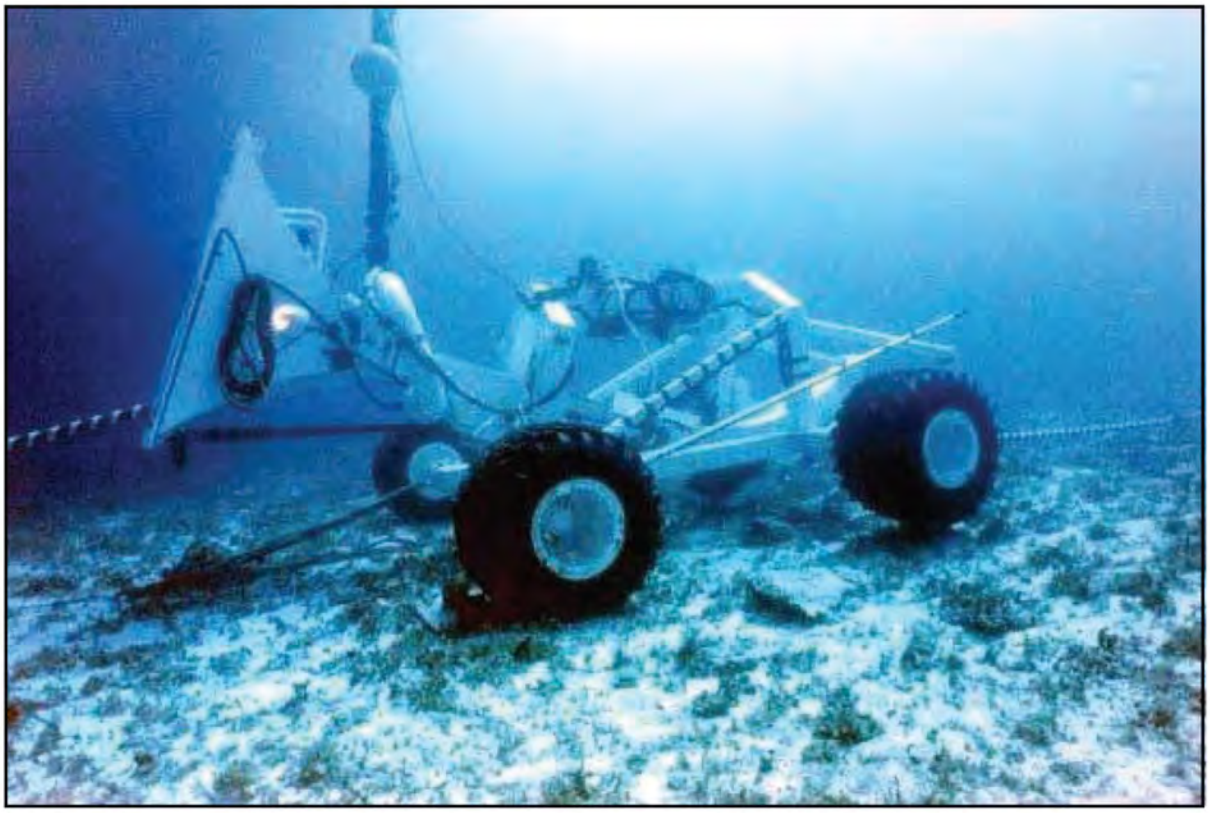
Depending on final hydraulic design, any collected stormwater would be either transferred by pumped pressure piping or gravity flow (surface or piped) to the existing 115 kV switchyard SPCC oil containment basin (near the intersection of Illinois and 23rd Streets), or after provisions for oil/water separation, directly into the stormwater collection system at the new 230 kV switchyard. Small amounts of additional temporary water storage (500 to 1,000 gallons) may be used as part of the water transference system from the new 230 kV switchyard area to the existing 115 kV switchyard area.

4.11.6.2 Embarcadero Substation

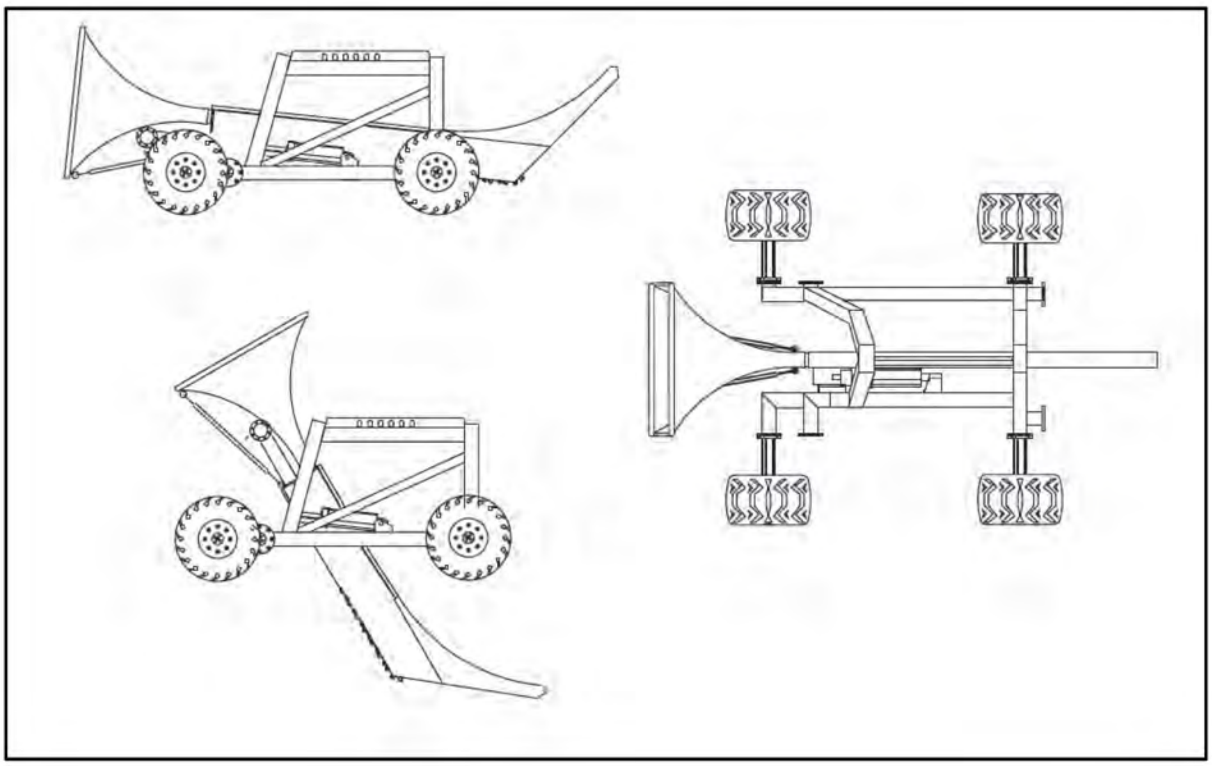
Since the connections at Embarcadero Substation would be made into either the existing structure or the upgraded 230 kV bus, the proposed work would only involve cable connection, energizing, and commissioning. The underground cable would be brought directly into the cable connection point of the gas insulated switchgear of the upgraded bus at Embarcadero Substation. The new 230 kV cable would then be connected into the new substation equipment. Energizing and final testing would take place, and immediately following termination and testing, the cable could be placed into service.

4.11.7 Submarine Cable Installation

The cables would be installed into the bottom sediments of the San Francisco Bay by hydroplow or other similar cable-burying technique, at a depth varying from approximately 6 to 10 feet below the floor of the bay. The Proposed Project would use a hydroplow that is pulled along the seabed behind a barge, as illustrated in Figure 4-17.



Actual hydroplow used in Trans Bay Cable project.



Source: PG&E, 2012.

Figure 4-17

Hydroplow

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4.11.7.1 Submarine Cable Installation Procedures

The transmission cables would be buried, where feasible, a minimum of 6 feet under the surface of the sediments to protect the cables from mechanical damage. The hydroplow barge would typically be pulled into position via two commercial tugboats, and the barge anchors would 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 would be propelled via two diesel engines — one for steering, the other for kedging anchor.

The barge would tow the hydroplow, a water jet that consists of a long blade mounted to either a sled- or tire-mounted submerged vehicle. The hydroplow blade contains water nozzles on the leading edge that displace the sediment using high-pressure water. PG&E proposes to use a hydroplow with low pressure water jets that would generally be engaged below the seabed, which would act to attenuate or dampen noise generated by the water jets and to minimize the underwater noise (PG&E, 2013). Deck-mounted water pumps take water from the bay to the plow for jetting; the pumps draft water from a vertical suction line that is set from the barge approximately 3 feet below the surface. The intake line would be equipped with a wire-mesh screen to screen debris and reduce potential entrainment.

Each submarine cable for the transmission line would be fed from the barge down to the seabed through the blade and would exit at the foot of the blade to be laid directly into the sea bottom sediments. The length and angle of the blade would determine 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. PG&E proposes to use this cable-laying method as a means of avoiding environmental disturbance that could otherwise occur through traditional mechanical trenching methods. The cable laying process is expected to require 24 to 36 hours of plowing time for each of the three cables, with 1 day needed before and after the hydroplowing to mobilize and demobilize. A team of approximately 21 people would be needed in-water and at the project site to perform the installation.

4.11.7.2 Alternative Submarine Cable Installation Procedures

PG&E developed the submarine cable route as part of a preliminary design to avoid known rocky soil conditions and any existing buried cables so that the proposed three submarine cables would be buried by hydroplow for their entire lengths. Nonetheless, either rocky soil conditions or existing (but unknown) cables crossing the route may not physically allow the cables to be buried. At these locations, the cables would be laid directly on the bottom of the bay for a short distance until they can again be buried into the sediments. To protect such segments of exposed cable from future damage by anchors, fishing gear, etc., concrete “blankets” or steel half-pipe sections would be placed over them. Typically, this might be done for 100 feet to either side of a crossing, at 50 feet in width (200 feet by 50 feet total area). PG&E’s preliminary engineering indicates that no such blankets or pipe would be needed. Final design review prior to construction would include a review of existing conditions. However, to allow flexibility should the need arise in final design evaluations, PG&E assumes that up to 5 percent of the route, or 650 feet in length by 50 feet in width, may need to be covered by blankets or pipe on the seafloor.

4.11.7.3 Submarine to Land Transitions

Installing the submarine-to-land transition conduit would occur using shore-based HDD. PG&E proposes to use this drilling method as a means of avoiding disturbance of the shoreline. Each of the three phases of submarine cable would transition from land to water in separate HDPE conduits installed by HDD methods from the two HDD transition locations inland to exit points on the bottom of the bay. On the land side, the HDD conduit would transition to the underground duct bank conduits through a transition manhole. The submarine cable would be pulled through the conduits and spliced to a land cable type inside this vault at the onshore transitions.

The Proposed Project would use a typical HDD installation with a guided drill head to open the initial hole followed by a series of increasingly larger drill bits to bring the opening to the desired final diameter. After the hole is at the specified diameter, the internal conduits would be bundled together and pulled at one time through the hole. The detailed design of the HDD installation would be done during the final design stages.

At each landing zone, HDD operations would last for approximately 6 to 7 weeks, starting with securing the area around the HDD pit, which generally includes closing one lane and closing street parking at least on one side. PG&E would coordinate construction with DHL at the southern transition along 23rd Street or its extension into the DHL facility to ensure continued commercial access during construction.

Work would include the following steps:

- Excavating the HDD entry pit and inserting the HDD rig.
- Drilling the HDD bore holes.
- Excavating an adjacent exit (receiving) pit at the exit of the bore hole to capture mud, which would be pumped up to a barge and disposed of per appropriate regulations.
- Pulling fused sections of HDPE pipe as conduit into the bore holes.
- Connecting the ends of HDPE pipes into the transition splice vaults.
- Pulling the submarine cables back through the HDPE pipes and then into the splice vaults.
- Splicing the submarine cable to the underground land cable in the splice vaults.
- Restoring the area to pre-construction conditions.

The horizontal drilling rig and support equipment would be rigged up within the available temporary workspace. Plastic sheeting would be placed under the drill rig and any support equipment that could have a potential for a hydraulic, fuel, or oil leak. Silt fencing, erosion control, and spill containment would also be provided around the drilling equipment in order to ensure no run-off would leave from the site. A temporary chain link fence would be installed around all of the drilling equipment.

Prior to the drill reaching the underwater exit, the fluids would be circulated through the HDD back to the drill rig and collected and cleaned for reuse. Before the end of the drilling operation, the HDD exit location would be identified and a localized excavation would be made in the seafloor sediments at the exit point to receive the heavy drilling fluids when the pilot hole is exited and during the pipe pulling operations.

At the proposed northern landing zone in Spear Street, the HDD entry points and final path would be determined during final design. Excavation for the HDD pit would likely occur within approximately 700 feet from the shoreline, and the drill would continue approximately another 1,000 to 2,300 feet to the exit point at the bottom of the bay floor. The HDD would transition to a depth of up to approximately 150 feet below ground, and would need to be at least 50 feet deep to pass below both the sewer transport/storage box under The Embarcadero and the seawall between Piers 28 and 30/32. This path would be above the bedrock layer, below the piles that support the seawall, and primarily within Colma Formation clayey sand deposits and bay muds (Figure 4-11). This drill path would also be a sufficient distance away from the steep offshore slope, permitting a smooth transition to direct burial of the cable within the bay floor.

At the proposed southern landing zone in 23rd Street, the HDD would begin at entry points and follow a path to be determined during final design. Excavation for the HDD pit would occur within the HDD entry pits and splice vault work zone depicted on Figure 4-9. The HDD would transition to a depth of approximately 30 to 50 feet below ground level and proceed approximately 1,000 feet to an exit point at the bottom of the bay floor. This path would stay above and close to the bedrock layer and within bay mud. No seawall or deep pile obstructions were identified by PG&E along this section of shoreline.

PG&E estimates that HDD activity and drill rig use at each of the HDD locations (north and south) would occur over 13 days per each of the three borings, for a total of 39 days total at each the northern and southern HDD landings. Each day is expected to include 10 hours of drilling, for a total of 390 hours at each transition; working 6 days per week, HDD operations would last 6 to 7 weeks. The duration of 39 days at each landing is the best estimate available to PG&E (PG&E, 2013).

PG&E expects to include acoustical performance specifications for contractors to use silencing during HDD activities to minimize the sound levels. The precise details of lane and parking space closures in the cul-de-sac on Spear Street would depend on final design (PG&E, 2013).

HDD Entry and Exit Pits

HDD entry pits would be up to about 5 feet wide, 8 feet long, and 6 feet deep and would be covered with steel plates during non-working hours. These pits would be used only for fluid containment before pumping the fluid to the control equipment for cleaning and re-circulation. Exit (receiving) pits in the bay would be up to about 24 feet by 12 feet long and 7 feet deep.

Excavation of entry pits would require saw cutting the asphalt and excavating with a backhoe. Receiving pits would be excavated using a clamshell dredger from a work barge anchored above the exit points. Shoring would be used for the entry (containment) pit, but no shoring would be undertaken in the exit (receiving) pits. The sides of the offshore pits would be sloped sufficiently such that shoring would not be necessary.

Pilot Hole Drilling

Pilot hole drilling would be discontinued approximately 50 to 75 feet away from the exit point, to leave a "plug" of soil between the drilled hole and the sea floor. At that location, the drill pipe would be "tripped" out of the hole and the hole would be forward-reamed to a diameter of about 20 inches (assuming a 14-inch outside diameter HDPE conduit).

Following the pilot hole, reaming tools may be used to enlarge the opening 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 would be continuously pumped into the hole to remove cuttings and maintain the integrity of the hole.

Reaming would be followed by "swabbing" to test the condition of the hole. Drilling fluids would be pumped into the hole during both of these operations. As a result of leaving the 50-foot to 75-foot plug in the bottom of the hole, all drilling fluids used during these processes would flow back to the entry point through the bore-hole annulus for re-circulating.

Pullback of Pipe, Conduit, and Cable

After swabbing the hole, the final 50 feet to 75 feet would be exited to the sea floor at which time some fluids would drain into the exit pits and containment sump. Once the hole has been sufficiently enlarged, the HDPE conduit and line would 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.

The pipe and casing of the HDPE conduit would be assembled and fused at the work area onshore within 23rd Street shown on Figure 4-9 (Potrero HDD Transition Area). Since the pipe would be a lightweight and durable conduit for the cable, it would be connected to a small boat and dragged until the pipe is floating on the water. Using the same boat, the conduit would then be tugged along the surface of the water to the area of each HDD exit (PG&E, 2013).

The HDPE pipe would be floated into place, the front end sunk and hooked up to the drill pipe, and the pullback would proceed. Detailed construction plans to be completed by the HDD contractor would specify whether or not part of the HDPE conduit would be rested on a barge to help guide it into the bore opening, or whether the pipe would simply be submerged to the bore opening from the surface of the water. As the pipe is pulled into the drilled hole, it would displace its volume of drilling fluids to the exit pit and containment sump for approximately half the length of the pipeline, at which time the flow would begin to turn around to the entry pit where it would be contained in frac tanks for either re-use or disposal. In addition to the displacement volume, additional drilling fluid would be pumped during the pullback and would flow to the exit containment sump.

Divers would attach the HDPE conduit and submarine cable to the end of the HDD, and the cable would be pulled back onshore; see Figure 4-18. After installation of the cable, divers would pump these fluids into tanks on the barge for transfer by vacuum trucks to an approved disposal site.

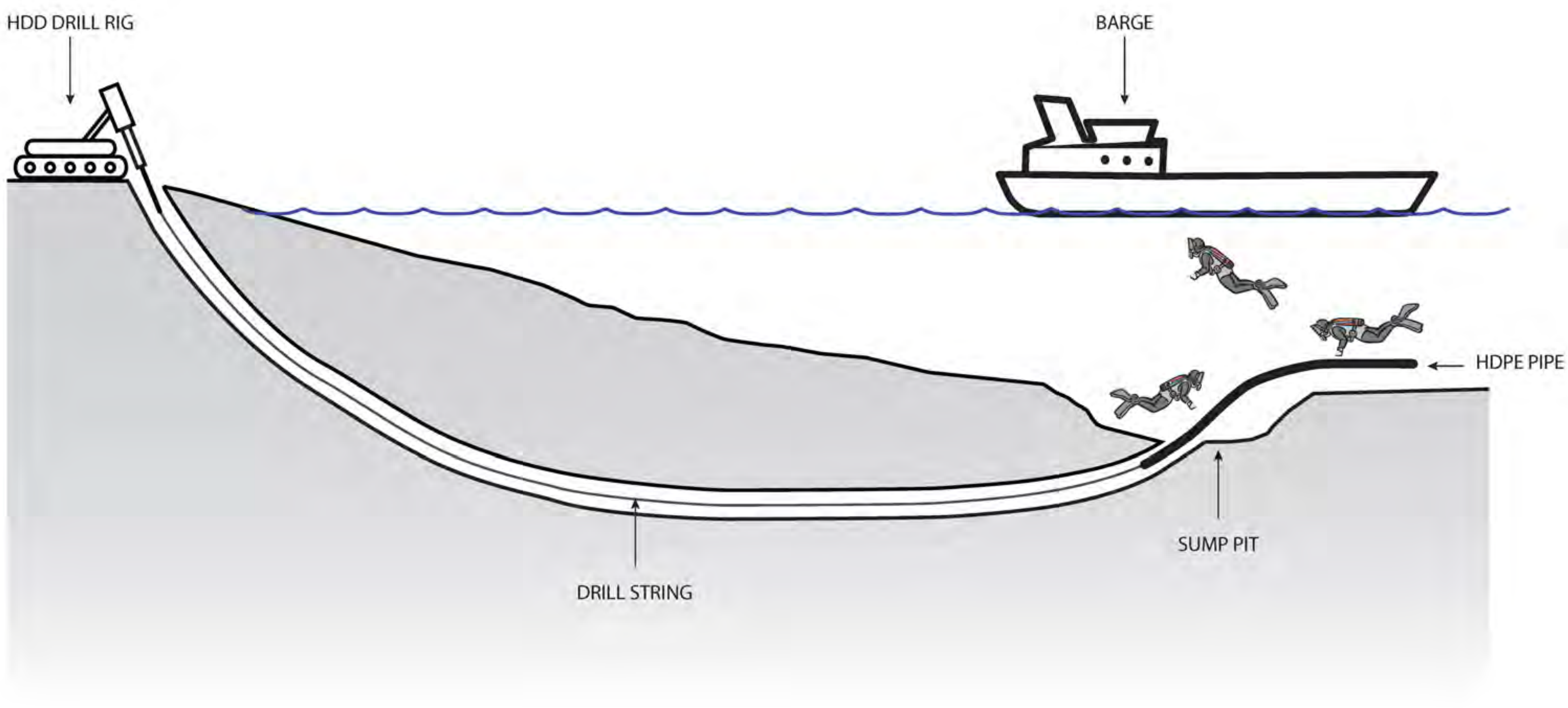
Pumps would not be expected to run continuously. Pumps for drilling fluids would only operate when drilling occurs and would not operate when pull back occurs. Pull-back could potentially require over-night work should pull-back necessitate prolonged work hours. If soil conditions are such that the integrity of the hole cannot be readily maintained with daytime only activities, HDD operations would have to proceed on a 24-hour basis (PG&E, 2013).

4.11.8 Construction Phasing

The timeline for construction and testing would be 22 months with initiation of service targeted for December 2015. The transmission line would require 15 months of work (September 2014 to December 2015), and this would overlap with 22 months of work (February 2014 to December 2015) for develop-ment of the Potrero 230 kV Switchyard. The preliminary schedule, including two to three months for additional permitting, is shown in Table 4-3.

This preliminary schedule in Table 4-3 includes the construction of the onshore underground transmis-sion line sections from substations to submarine cable ends; HDD construction for the submarine cable landing; submarine cable transportation and installation; and overall cable system testing and commis-sioning. The duration also conservatively includes hydroplow work only during the San Francisco Central Bay dredging work windows to minimize potential impacts to marine species.

Construction hours would typically be between 7 a.m. and 8 p.m., or during times set through coordina-tion with the City and County of San Francisco. Trenching would progress at an approximate rate of 50 feet per day, and approximately 150 feet to 300 feet of trench would be open at any one time. The total



Aspen Environmental Group

Source: PG&E, 2012.

Figure 4-18
HDD Outfall

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Table 4-3. Preliminary Proposed Construction Schedule

	Dec 2013	Jan 2014	Feb 2014	Mar 2014	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015	Aug 2015	Sep 2015	Oct 2015	Nov 2015	Dec 2015
Transmission Line Construction																									
Permitting, ROW Acquisition	X	X	X	X	X	X	X	X	X	X															
Onshore Underground Installation										X	X	X	X	X	X	X	X								
Offshore to Onshore HDD Transition											X	X	X	X	X	X	X	X							
Offshore Submarine Installation																			X	X	X	X	X	X	
Testing and Commissioning																									X
Potrero Switchyard Development																									
Switchyard Site Preparation			X	X	X	X	X																		
Building Construction							X	X	X	X	X	X	X	X	X										
Substation Interconnection											X	X	X	X	X	X									
Substation Installation													X	X	X	X	X	X	X	X	X	X	X	X	
Testing and Commissioning																									X
In-Service Date																									X

Source: Table 2-5 of PG&E, 2012a; PG&E, 2013.
Anticipated construction hours: 10 hours per day, 5 days per week.

duration of trench excavation and manhole installation, not including cable pulling and HDD operations, is estimated to take approximately four months for the northern underground segment along Spear and Folsom Streets and two months for the southern underground segment on 23rd Street. If trenching work would cause potential traffic congestion, the project may require nighttime work to avoid traffic disruption.

Along the trench route in city streets, PG&E would also require 4 to 7 days for installing each vault, 2 days for conduit cleaning/proofing, 2 days for cable pulling, and 2 to 3 days for racking and splicing at the landing single phase vaults and 7 to 9 days at the Folsom Street three-phase vault. Although some work may overlap, in total, each vault location would have approximately 13 days of sustained lane closure. Work to complete the two HDD transitions, install HDPE conduit, and pullback cable would take 129 days. Final paving restoration would be scheduled after the cable is fully installed and operative; final paving would take 5 days along Spear and Folsom Streets and 2 days on 23rd Street.

4.11.9 Workforce and Equipment

Construction would involve a workforce of 15 to 75 people at any one time (pp. 5-6 of PG&E, 2012a). Approximately 30 construction personnel and approximately 8 truck drivers would be employed for excavation and conduit installation using two excavation crews. Approximately 20 construction personnel would be employed during cable installation, 15 construction personnel during the HDD installations, and 25 construction personnel during the submarine cable installation. The number of employees would peak at approximately 75 construction personnel, including switchyard workers, supervisors, and inspectors. PG&E expects to hire approximately 20 percent of its construction workforce locally (roughly 10 to 15 employees). Up to 40 round-trips (80 one-way trips) would occur for workers traveling to and from each work site daily (p. 3.16-17 of PG&E, 2012a).

PG&E would require project contractors to make a good faith effort to establish a local hiring plan in collaboration with PG&E and City Build, a City of San Francisco agency created to develop local jobs and hiring in the City. Equipment expected to be used during project construction is summarized in Table 4-4.

Table 4-4. Equipment Expected to be Used During Construction

Equipment	Quantity	Use	Expected Duration of Use
Underground Delivery and Set-Up			
Rigging truck	1	Underground Transmission Line Delivery and Setup, manhole installation	40 days
Mechanics truck	1	Equipment repair	As needed only
Small mobile crane	1	Underground duct bank installation delivery and setup	4 months
Shop van	2	Cable splice	1 month
2-ton flatbed truck	1	Conduit installation	4 months
Underground Transmission Line and Switchyard Construction			
Pickup trucks	4 to 10	Transport construction personnel	8 months
2-ton flatbed truck	2	Haul materials	6 months
Flatbed boom truck	2	Haul and unload materials	6 months
Rigging truck	1	Haul tools and equipment	6 months

Table 4-4. Equipment Expected to be Used During Construction

Equipment	Quantity	Use	Expected Duration of Use
Mechanic truck	1	Service and repair equipment	As needed only
Winch truck	1	Install and pull rope into position in conduits	22 days
Cable puller truck	1	Pull transmission cables through conduits	22 days
Cement trucks	2	Transport and pour backfill slurry	4 months
Shop vans	2	Store tools	8 months
Crawler backhoe	2	Excavate trenches (excavate around obstructions)	4 months
Large backhoe	2	Excavate trenches (main trencher)	4 months
Dump trucks	4	Haul trench and excavation materials/import backfill	6 months
Large mobile crane	1-2	Lift/load/set 20-ton cable reels and prefabricated 40-ton splice vaults and lift cable ends on terminating structures	22 days
Small mobile cranes (<12 tons)	2	Load and unload materials	22 days
Cable reel trailers	2	Transport cable reels and feed cables into conduits	22 days
Splice trailer (40-foot)	1	Splicing supplies for cable splice/air condition manholes	40 days
Air compressors	Variable	Operate air tools	3 months
Air tampers	Variable	Compact soil	6 months
Rollers	1	Repave streets over trench and manhole locations	6 months
Paver	1	Repave streets over trench and manhole locations	6 months
Portable generators	1-3	Construction power	8 months
Horizontal Directional Drill equipment	1	For horizontal bores by HDD	3 months
Baker (water) storage tanks	As needed	Store water pumped from trenches, if needed	4 months
Pumps	As needed	Remove water from trench, if needed	4 months
Shoring boxes	Variable	Maintain trench walls, prevent collapse of loose soils or sand	6 months
Tank trucks	As needed	Transport water from Baker tanks, to process/disposal facility	6 months
Submarine Cable Installation			
Small motor harbor craft	3	Cable Laying (22 days)	22 days
Cable laying barge	1	Hydroplow guide	22 days
Tug or other vessel	1 to 2 intermittent	To position barge	Intermittent, 22 days
Submarine to Land Transitions (HDD Transitions)			
Small motor harbor craft	2	HDD Operation, for moving people, conduit, and as safety watch	129 days
Barge	1	To serve as work platform during HDD operation, with generator to power drilling mud vacuum and other tools, including clamshell dredger	129 days
Tug or other vessel	1 to 2 intermittent	To position barge during HDD operation	Intermittent, 22 days

Source: Table 2-4 of PG&E, 2012a; PG&E, 2013.

4.12 Operation and Maintenance

Once the project is built and energized, PG&E's existing local maintenance and operations group would assume monitoring and control duties and maintenance, inspection, and security roles, as needed, with support from a marine contractor. Aside from contracted stand-by marine transportation and technical support, no additional staff would be hired by PG&E after the transmission project is energized and placed into service.

Monitoring and control functions for the new facilities would be connected to the existing PG&E computer system by telecommunications. Regular inspection of transmission lines, substations, instrumentation and control, and support systems is critical for safe, efficient, and economical operation. Early identification of items needing maintenance, repair, or replacement would ensure continued safe operation of the project. Aboveground components would be inspected at least annually for corrosion, equipment misalignment, loose fittings, and other common mechanical problems. The underground portion of the line would be inspected regularly from inside the vaults to avoid disturbing traffic using city streets (Section 2.8 of PG&E, 2012a).

Routine inspection of the underground terminals would occur every three months, and detailed video and infrared inspection of vaults, splices, and terminals would occur every two years. A Distributed Temperature Sensing system of fiber optics integrated in the body of the cable would be used to monitor the submarine and underground cable.

4.12.1 Submarine Cable

Recording on Maritime Maps

Once the submarine cables are installed they would be recorded by the Coast Guard and given to NOAA for publication. PG&E would publish a Local Notice to Mariners (LNM) via Coast Guard District 11. This would provide advisory to the San Francisco Vessel Traffic Service (VTS) to allow the management of waterway traffic over VHF-FM Channel 14 requiring transit through the project location.

Surveying and Maritime Alert System

PG&E intends to conduct marine surveys at regular intervals after cable installation to assess whether potential seabed topography changes have occurred along the cable route. A cable-tracking system may be deployed as part of the route survey to confirm cable burial depth.

Besides promoting the new cable awareness and engaging stakeholders by registering the new cable on navigational maps, PG&E intends to implement an operation and maintenance strategy that would include an automatic identification system (AIS) vessel monitoring to ensure the new cable security. The system would use live vessel position in conjunction with the cable location information to create automatic warnings if the cable is at risk due to abnormal shipping activities such as vessels that are off-course or moving at unusual speed.

4.13 Applicant Proposed Measures

PG&E proposes to implement certain measures to ensure the Proposed Project would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. PG&E proposes to implement these measures during the design, construction, and operation of the Proposed Project in order to avoid or minimize potential environmental impacts (PG&E, 2012a; PG&E, 2013).

Applicant Proposed Measures (APMs) listed in Table 4-5 are considered part of the Proposed Project and are considered in the evaluation of environmental impacts (see Section 5, Initial Study). CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study.

Table 4-5 lists each APM by environmental issue area. In some cases, mitigation measures presented in Section 5 either expand upon or add detail to the APMs presented in Table 4-5 if necessary, to ensure that potential impacts would be reduced to less than significant levels.

Table 4-5. Applicant Proposed Measures (APMs)

APM Number	Issue Area
	Aesthetics
APM 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.
	Agricultural and Forestry Resources
There are no agricultural or forest lands in the vicinity of the project. Therefore, no Applicant Proposed Measures are included for agricultural resources.	
	Air Quality
APM AQ-1	**Minimize Fugitive Dust.** Consistent with Table 2 of the [1999] 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.

Table 4-5. Applicant Proposed Measures (APMs)

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 Airborne Toxic Control Measure (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

Table 4-5. Applicant Proposed Measures (APMs)

	Biological Resources
APM 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.

Table 4-5. Applicant Proposed Measures (APMs)

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 hydro-plowing 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.
	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.

Table 4-5. Applicant Proposed Measures (APMs)

APM CUL-3	**Construction Monitoring.** A professional archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards will monitor all project-related on-shore excavation that is within an area of moderate to high sensitivity for prehistoric or historical buried resources, as such areas are presented in PEA Appendix D (Nolte et al. 2012). This shall include monitoring areas within 167 feet (50 meters) of recorded or previously identified prehistoric and historical-era sites or features, APM CUL-3 will be guided by an Archaeological Monitoring and Inadvertent Discovery Plan, which will include the framework for evaluation and treatment of any unanticipated discoveries described in APM CUL-4. In addition to the monitoring archaeologist, a qualified maritime archaeologist will be on call during construction to assist with implementation of the Archaeological Monitoring and Inadvertent Discovery Plan should maritime resources be identified during excavation. If appropriately qualified, the same person may act as both the monitoring archaeologist and maritime archaeologist. This APM CUL-3 in combination with APM CUL-4 will ensure that archaeological resources will not be impacted during construction without adequate evaluation and any necessary actions (as further detailed in APM CUL-4 and the Archaeological Monitoring and Inadvertent Discovery Plan) to preserve information regarding impacted resources. Site assessment procedures and data recovery or other measures will be developed as part of the Archaeological Monitoring Plan and applied during the monitoring process.
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 PEA Appendix D (Nolte et al. 2012) 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.

Table 4-5. Applicant Proposed Measures (APMs)

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, and the brick wall that fronts Station A and that serves as a visual barrier will be partially or completely removed. Prior to construction, the setting and exterior of the Station and brick wall 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.
APM CUL-8	**Apply Secretary of the Interior Standards for the Treatment of Historic Properties to Brick Wall Modifications.** The gate in the brick wall that fronts Station A will be widened and the wall removed or modified to allow access for large transformer equipment and future maintenance activities. Modifications to or removal of the wall will follow the Secretary of the Interior Standards for the Treatment of Historic Properties (available at http://www.nps.gov/hps/tps/standguide/) and will be designed to be compatible with the historic character of Station A. PG&E will submit a draft of its design for the brick wall modifications to the Commission no less than 30 days prior to any alteration of the wall.
	Paleontological Resources
APM 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.
	Geology and Soils
APM 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).

Table 4-5. Applicant Proposed Measures (APMs)

Greenhouse Gas Emissions	
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 SF6 Emissions.** PG&E will include Potrero Switchyard in PG&E's system-wide SF6 emission reduction program, which includes inventorying and monitoring system-wide SF6 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 SF6 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 SF6 Emission Reduction Partnership for Electric Power Systems, a voluntary program between the USEPA and electric power companies that focuses on reducing emissions of SF6 from transmission and distribution operations. Since 1998, PG&E has reduced its SF6 leakage rate by 89 percent and absolute SF6 emissions by 83 percent.
- PG&E supports Natural Gas STAR, a program promoting the reduction of CH4 from natural gas pipeline operations. Since 1998, PG&E has avoided the release of thousands of tons of CH4.
- 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.

Table 4-5. Applicant Proposed Measures (APMs)

	Hazards and Hazardous Materials
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), 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 PEA Section 3.9, Hydrology and Water Quality. ▪ Stopping work at that location and contacting the CUPA (SFDPH Environmental Health Section; see PEA 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. *(Also see APM WQ-1 and APM WQ-3 in PEA Section 3.9.4.2)*
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 PEA Section 3.8.3.1), as well as the Maher Ordinance (see PEA Section 3.8.2.1).
APM HM-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 up, it will be removed and transported for disposal, according to applicable regulations. *(Also see APM WQ-4.)*

Table 4-5. Applicant Proposed Measures (APMs)

APM HM-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. *(Also see APM WQ-5.)*
APM HM-6	**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. *(Also see APM WQ-6 and APM WQ-7.)*
APM HM-7	**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. *(Also see APM WQ-8.)*

Table 4-5. Applicant Proposed Measures (APMs)

	Hydrology and Water Quality
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. 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 PEA 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	**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. *(Also see APM HM-1.)*

Table 4-5. Applicant Proposed Measures (APMs)

APM WQ-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. *(Also see APM HM-4.)*
APM WQ-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. *(Also see APM HM-5.)*
APM WQ-6	**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 PEA 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. *(Also see APM HM-6 and APM WQ-7.)*
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.

Table 4-5. Applicant Proposed Measures (APMs)

APM WQ-8	**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. *(Also see APM HM-7.)*
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.
APM WQ-10	**Sediment Monitoring and Response Plan.** Estimates of the amounts of material that may be suspended will vary depending on the specific type of equipment to be used. During final design, the expected equipment type will be identified and an evaluation can be made of the amount of sediment expected to be suspended. Along with the sediment quality information being gathered as described in APM WQ-8 and APM HM-7, this information will be used to determine, in coordination with the RWQCB, allowable thresholds of turbidity in the area of operations. A Sediment Monitoring and Response Plan will be developed in coordination with the RWQCB, taking into account equipment and the results of sediment sampling, that will set monitoring distance and methodology, acceptable thresholds of turbidity compared to background, and adaptive operational controls that will be used to reduce sediment suspension. These controls may include, but are not limited to, increasing or decreasing the speed of cable installation operation, increasing or decreasing the operational jet nozzle pressure, adjusting the operational angle of the jet nozzles on the burial blade, and other operational parameters that may reduce sediment suspension.
	Land Use and Planning
APM 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.

Table 4-5. Applicant Proposed Measures (APMs)

Mineral Resources	
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 included with this project.	
Noise	
APM 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, and/or 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.
Population and Housing	
No Applicant Proposed Measures are included for population and housing.	
Public Services	
No Applicant Proposed Measures are included for public services.	
Recreation	
No Applicant Proposed Measures are included for recreation.	

Table 4-5. Applicant Proposed Measures (APMs)

	Transportation
APM 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.
	Utilities and Service Systems
APM 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.

4.14 Other Permits and Approvals

The CPUC is the lead agency for CEQA review of this project. In accordance with CPUC General Order 131-D, PG&E prepared and submitted a Proponent's Environmental Assessment (PEA) as part of its CPCN application (A.12-12-004). The CPUC has exclusive authority to approve or deny PG&E's application; however, various permits from other agencies may also need to be obtained by PG&E to build the Proposed Project. If the CPUC issues a CPCN, it would provide overall project approval and certify compliance of the project with CEQA. In addition to the CPCN, Table 4-6 summarizes the other permits or approvals from other federal, State, and local agencies that may be needed for the project.

Table 4-6. Permits that May Be Required for the Embarcadero-Potrero 230 kV Transmission Project

Agency	Jurisdiction	Requirements
Federal/State Agencies		
U.S. Army Corps of Engineers (USACE), San Francisco District	San Francisco Bay	Permit (i.e., a federal action) and Environmental Assessment for marine cable installation in San Francisco Bay under the Clean Water Act Section 404 and the Rivers and Harbors Act Section 10.
USACE, Operations and Readiness Division, Dredged Material Management Office (DMMO)	San Francisco Bay	Consolidated Dredging-Dredge Material Reuse/Disposal authorization, if needed for HDD exit pits
U.S. Coast Guard (USCG)	San Francisco Bay	Establish Vessel Traffic Safety zone; Issuance of appropriate Notice to Mariners
San Francisco Bay Conservation and Development Commission (BCDC)	San Francisco Bay	Permit for dredging and disposal activity in the bay, if needed for HDD exit pits; Administrative permit for work within the Bay and/or shoreline band; Determination of consistency of USACE federal action with San Francisco Bay Plan under the federal Coastal Zone Management Act (CZMA)
National Marine Fisheries Service (NMFS), Southwest Regional Office	San Francisco Bay	Consultation or technical assistance under Section 7 of the Endangered Species Act (ESA) regarding USACE permit; Potential impact to Essential Fish Habitat (EFH); Potential Incidental Harassment Authorization (IHA) permit under Marine Mammal Protection Act (MMPA)
U.S. Fish and Wildlife Service (USFWS), Sacramento Field Office	San Francisco Bay	Consultation under Section 7 of the Endangered Species Act (ESA) regarding USACE permit; Enforcement of the Migratory Bird Treaty Act (MBTA)
California Department of Fish and Wildlife (CDFW)	Endangered species consultation	California Endangered Species Act coordination, Section 20801 Incidental Take Permit or Consistency Determination under California Fish and Game Code Section 2080.1
Regional Water Quality Control Board (RWQCB) – San Francisco Bay Region	San Francisco Bay Hydrologic Region	National Pollution Discharge Elimination System (NPDES); General Construction Storm Water Pollution Prevention Plan (SWPPP); Water Quality Certification
California State Lands Commission (CSLC)	Tidal waterways of the bay and submerged lands below the mean high tide line	Residual and review authority over actions managing lands legislatively granted to City and County of San Francisco.
California Department of Transportation (Caltrans)	Spear Street area under the Bay Bridge	Encroachment permit and design review

Table 4-6. Permits that May Be Required for the Embarcadero-Potrero 230 kV Transmission Project

Agency	Jurisdiction	Requirements
Local/Regional Agencies		
Port of San Francisco	San Francisco Bay and waterfront lands, including portions of Spear Street and the proposed Potrero 230 kV Switchyard	License
City and County of San Francisco	23rd Street, Shoreline to Potrero Switchyard; Spear Street and Folsom Street	ROW Acquisition and/or reestablish utility franchise area
San Francisco Municipal Transportation Agency (SFMTA)	City streets and sidewalks	Special Traffic Permit, with Traffic Management Plan
San Francisco Department of Public Works (SFDPW)	City streets and sidewalks	Excavation Permit
San Francisco Department of Public Works or Department of Building Inspection	City streets and sidewalks	Special permit for nighttime construction work under the Noise Ordinance (Section 2908 of Police Code)
San Francisco Public Utilities Commission (SFPUC)	Dewatering and Water Supply	Water disposal and water supply for construction activity

4.15 Electric and Magnetic Fields Summary

4.15.1 Electric and Magnetic Fields

Recognizing that there is public interest and concern regarding potential health effects that could result from exposure to electric and magnetic fields (EMF) from power lines, this document provides information regarding EMF associated with electric utility facilities and the potential effects of the Proposed Project related to public health and safety. Potential health effects from exposure to ***electric fields*** from power lines (produced by the existence of an electric charge, such as an electron, ion, or proton, in the volume of space or medium that surrounds it) are typically not of concern since electric fields are effectively shielded by materials such as trees, walls, etc. Therefore, the majority of the following information related to EMF focuses primarily on exposure to ***magnetic fields*** (invisible fields created by moving charges) from power lines.

Magnetic fields can be reduced either by cancellation or by increasing distance from the source. Cancellation is achieved in two ways. A transmission line circuit consists of three “phases”: three separate wires (conductors), usually on an overhead tower. The configuration of these three conductors can reduce magnetic fields. When the configuration places the three conductors closer together, the interference, or cancellation, of the fields from each wire is enhanced, and the magnetic field is reduced. This technique has practical limitations because of the potential for short circuits if the wires are placed too close together. Close conductor spacing can also create worker safety concerns because there is a risk of workers contacting energized conductors during maintenance. The cables used in underground high voltage transmission lines are insulated (coated) to allow the three phases to be much closer together than on overhead lines.

This Initial Study does not consider magnetic fields in the context of CEQA and determination of environmental impact. This is because (a) there is no agreement among scientists that EMF does create a potential health risk, and therefore, (b) there are no defined or adopted CEQA standards for defining health risk from EMF. As a result, EMF information is presented for the benefit of the public and decisionmakers.

After several decades of study regarding potential public health risks from exposure to power line EMF, research results remains inconclusive. Several national and international panels have conducted reviews of data from multiple studies and state that there is not sufficient evidence to conclude that EMF causes cancer. The International Agency for Research on Cancer (IARC), an agency of the World Health Organization (WHO), and the California Department of Health Services (DHS) both classified EMF as a possible carcinogen (WHO, 2001; DHS, 2002).

In addition, the 2007 WHO [Environmental Health Criteria (EHC) 238] report concluded that:

- Evidence for a link between Extremely Low Frequency (ELF, 50–60 Hz) magnetic fields and health risks is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukemia. However, "…virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status.…the evidence is not strong enough to be considered causal but sufficiently strong to remain a concern."
- "For other diseases, there is inadequate or no evidence of health effects at low exposure levels."

Currently, there are no applicable regulations related to EMF levels from power lines or substations. However, following a CPUC decision from 1993 (Decision [D.]93-11-013) that was reaffirmed by the CPUC on January 27, 2006 (D.06-01-042), the CPUC requires utilities to incorporate "low-cost" or "no-cost" measures to mitigate EMF from new or upgraded electrical utility facilities up to approximately 4 percent of total project cost. To comply with this requirement, PG&E developed and included a Preliminary Transmission EMF Management Plan as part of the proposed Embarcadero-Potrero 230 kV Transmission Project to reduce magnetic field levels in the vicinity of the transmission line.

4.15.2 EMF in the Proposed Project Area

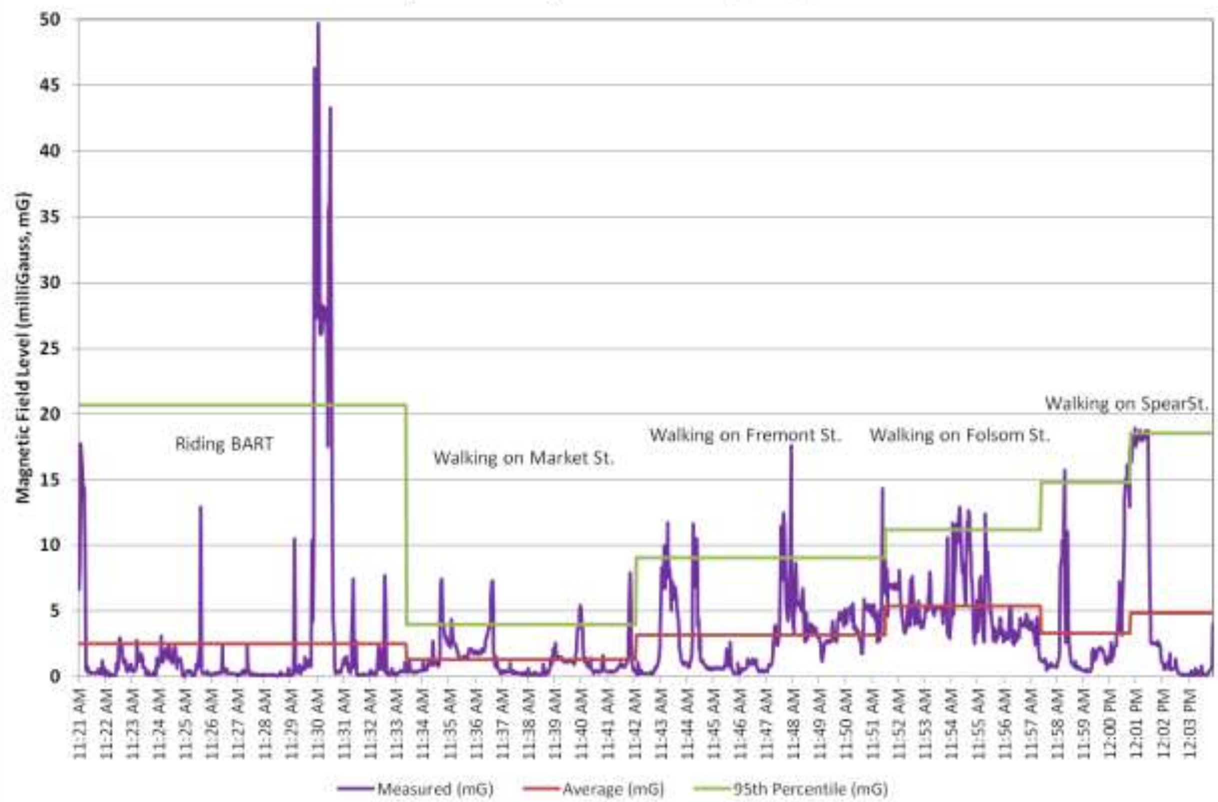
Residents and owners of a day care facility near the proposed Embarcadero-Potrero 230 kV Transmission Project have expressed concerns about the specific location in the city streets where the underground 230 kV line would be located and the proposed depth of burial. These concerns focus on the safety and health effects to people in the residential apartments and condominium towers (along Spear and Folsom Streets) and Bright Horizons/Marin Day School Hills Plaza Campus day care that would be adjacent to the northern portion of the transmission line. This section discusses PG&E's general practices regarding EMF and the specific EMF reduction measures proposed by PG&E for the Proposed Project.

Magnetic field strength is a function of both the electric current carried by the wires, and the configuration and design of the three conductors that together form a single circuit of an electric transmission line. Magnetic field strengths for typical transmission power line loads at the edge of an <u>overhead</u> transmission system right-of-way generally range from 10 to 30 milliGauss (mG) (NIEHS, 2002). Exposure to EMF occurs in the community from sources other than electric transmission lines. Research on ambient magnetic fields in homes indicates that levels below 0.6 mG could be found in half of the studied homes in the centers of rooms, and that the average levels in the homes away from electrical appliances was 0.9 mG. Immediately adjacent to appliances (within 12 inches), field values are much higher, for example: 4 to 8 mG near electric ovens and ranges, 20 mG for portable heaters, or 60 mG for vacuum cleaners (NIEHS, 2002).

Outside of the home, the public also experiences EMF exposure from the electric distribution system that is located throughout all areas of the community. In areas of <u>underground</u> electric distribution, such as downtown San Francisco, the distribution lines are not buried as deeply as the higher voltage transmission lines, and are not arranged to optimize field cancellation. Figure 4-19 shows the magnetic field levels experienced by a pedestrian traveling through downtown San Francisco, including the Folsom and

Spear Street segments of the project's underground route (PG&E, 2013). The time-average levels of magnetic field exposure experienced by the pedestrian over the 40-minute period were 1.3 to 5.4 mG.

Figure 4-19. San Francisco Downtown, Pedestrian Magnetic Field Levels
(Measured by PG&E on Jan. 17, 2013)



4.15.3 EMF Management Plan for the Proposed Project

PG&E's EMF Design Guidelines. Without considering any of PG&E's proposed measures to reduce magnetic fields, the base-case design of the Embarcadero-Potrero 230 kV Transmission Project would produce a magnetic field level of 29.4 mG measured at three feet above the ground along the centerline of the underground transmission line and 3.0 mG at 23 feet away from the centerline (PG&E, 2013).

In accordance with Section X(A) of CPUC General Order 131-D, Decision No. D.06-01-042, and PG&E's EMF Design Guidelines prepared in accordance with the EMF Decision, PG&E will incorporate "no cost" and "low cost" magnetic field reduction steps in the design of the proposed transmission line and switchyard.

PG&E's guidelines call for implementation of measures to reduce magnetic fields based on the land uses surrounding each project, in the following priority:

- Schools or day care centers
- Residential properties
- Commercial/industrial land uses
- Recreational sites

- Agricultural lands
- Undeveloped land

The options in PG&E's EMF Design Guidelines include the following measures, any or all of which may be selected to reduce the magnetic field strength levels from the proposed transmission line:

- Arranging the conductors in a triangular configuration to maximize field cancellation.
- Placing the conductors for the transmission line in the right-of-way at the greatest distance from buildings housing priority land uses to reduce magnetic field exposure along the entire route, except where the location of existing underground utilities prevent strategic line placement.
- Moving the conductors further from the edge of the right-of-way near high priority groups including school, day care, and residential land uses. This can be done by installing the conductors in a deeper than normal trench, e.g., by lowering the depth of the duct bank five feet deeper than otherwise required by basic engineering practice.

Proposed EMF Reduction Measures. The Preliminary Transmission EMF Management Plan for the proposed Embarcadero-Potrero 230 kV Transmission Project includes each of these measures along the entire northern segment, including Spear and Folsom Streets to the Embarcadero Substation, as "no cost" and "low cost" magnetic field reduction steps:

- Triangular configuration,
- Strategic line placement, and
- Lowering the trench an additional five feet.

Placing the transmission line in a trench five feet lower than the base-case design would reduce the magnetic field level from the base-case of 29.4 mG to 10.9 mG, for a 63 percent reduction, when measured at three feet above the ground along the centerline of the underground transmission line. For locations 23 feet away from the centerline, the lower trench would reduce the magnetic field level from the base-case of 3.0 mG to 2.6 mG, for a 15 percent reduction (PG&E, 2013).

Inspection of other underground utilities in the area is ongoing by PG&E. Final engineering and selection of the alignment of the line would include seeking opportunities to strategically place the line farther from priority land uses, where feasible.

Additional information regarding EMF and the Embarcadero-Potrero 230 kV Transmission Project can be found in Appendix C of the Proponent's Environmental Assessment, Electric and Magnetic Fields Discussion, and in CPCN application Exhibit D, Preliminary Transmission EMF Management Plan and Substation Checklist, which was submitted to the CPUC with PG&E's CPCN application (A.12-12-004). PG&E's CPCN application and Proponent's Environmental Assessment are available for public review at the CPUC Energy Division CEQA Unit and on the project website at:

http://www.cpuc.ca.gov/Environment/info/aspen/embarc-potrero/embarc-potrero.htm

If the project is approved by the CPUC, PG&E would prepare and submit to the CPUC a Final EMF Management Plan containing the precise EMF measures to be employed for the project. Interested parties may contact PG&E's Project Information Line at 415-973-5530 to receive a copy of the Final EMF Management Plan once it has been prepared (PG&E, 2012a).

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5. Initial Study

5.1 Aesthetics

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?	☐	☐	☒	☐

Significance criteria established by CEQA Guidelines, Appendix G.

5.1.1 Setting

Aesthetics, as addressed in the California Environmental Quality Act (CEQA), refers to visual considerations in the physical environment. Aesthetics analysis, or visual resource analysis, is a process to systematically assess anticipated visible change in the physical environment and a viewer's response to that change. This analysis describes the existing character of the project area landscape, existing views of the project area from various vantage points on the ground, visual characteristics of the Proposed Project itself, and the landscape changes that would result from the construction and operation of the Proposed Project, as seen from various vantage points.

The project would include a new Potrero 230 kV Switchyard and a 230 kV transmission line connecting the new Potrero Switchyard and the existing Embarcadero Substation. The approximately 3.5-mile long transmission line would include: 2.5 miles of submarine cable installed in the bay; 0.4 miles of horizontal directional drilling between the bay and onshore transition points at either end; and 0.6 miles of underground installation in paved areas, including Spear and Folsom Streets in the Rincon Hill area and 23rd Street east of Illinois Street in the Central Waterfront.

The proposed Potrero 230 kV Switchyard would be near the eastern waterfront of San Francisco, in a predominantly industrial setting. Two regional freeways, Interstate 280 (I-280) and Highway 101, are 0.33 miles and 1 mile west of the site, respectively. A grid of local streets provides access to the project vicinity and the site. The site is approximately 20 feet above sea level and the topography in the immediate area is relatively level. Potrero Hill, a residential and commercial district approximately 0.5 miles to the west, west of an elevated portion of I-280, rises to an elevation of about 300 feet. The Dogpatch neighborhood of San Francisco is located on the flats between Potrero Hill and the project site. This neighborhood includes the Dogpatch Historic District, bounded by Third Street and Indiana Street on the east and west and Mariposa Street and 23rd Street on the north and south. Existing buildings, structures, and vegetation screen the site from the historic district.

The proposed switchyard site would front on 23rd Street, between 400 and 600 feet east of Illinois Street. Approximately 150 feet past the site, 23rd Street dead-ends. There is no public access beyond this point, including to the waterfront. The site is approximately 400 feet from the nearest point of the San Francisco Bay shoreline, Warm Water Cove. In the immediate site vicinity, industrial and warehouse facilities and utility structures are the dominant urban landscape features. These include the existing Potrero 115 kV Switchyard, the decommissioned former Potrero Power Plant, several overhead power lines, and the recently constructed Trans Bay Cable (TBC) facility directly across 23rd Street from the proposed Potrero 230 kV Switchyard site.

The Port of San Francisco's Pier 70 is northeast of the site. The area immediately adjacent to the site is characterized by industrial activities and appurtenances, including cranes, large buildings, walls, fencing, and port facilities. However, the area west of Third Street, 1.5 blocks west of the site, consists of residential, commercial, and public uses. Third Street is a light rail corridor with transit stations and streetscape amenities. The corridor provides a major local connection between San Francisco's downtown and its southeastern neighborhoods. Residential development comprised of both new construction and renovated and re-purposed industrial buildings occurs along the corridor and to the west.

Existing Landscape Setting and Viewer Characteristics

This section discusses the existing visual character and quality of the area; existing visual quality in the area; and viewer concern and viewer exposure to the Proposed Project, leading to a rating of overall visual sensitivity. Also discussed are the existing sources of light and glare within the project area.

Regional Context. The Proposed Project would be entirely within the City and County of San Francisco. The proposed transmission line between Embarcadero Substation and Potrero Switchyard would be located underground on land and underwater in the bay. The northern terminus of the Proposed Project would be Embarcadero Substation, at the southeast corner of Fremont and Folsom Streets in the Rincon Hill area. The northern portion of the transmission line would be underground in the paved Folsom Street and Spear Street rights-of-way, to a northern horizontal directional drilling (HDD) transition point in Spear Street, from where a bore would be drilled to the water. Land uses along Folsom and Spear Streets are a combination of commercial and residential uses, including apartment and condominium towers, parking lots, and the Transbay Temporary Terminal.

In the bay, the proposed transmission line would run more than a quarter-mile offshore from Piers 28 and 30/32, before returning to land via a second HDD transition at the extension of 23rd Street. The new Potrero 230 kV Switchyard would be constructed on the north side of 23rd Street within the former Potrero Power Plant site now owned by GenOn Energy, Inc. Adjacent land uses on the south side of 23rd Street are a freight and logistics company (DHL) facility at 401 23rd Street, a storage facility, and the high voltage direct current (HVDC) converter station for the Trans Bay Cable.

Local Project Viewshed and Key Observation Points. A project viewshed is the area from which the Proposed Project would be visible. For purposes of analysis, viewing distances or zones in a viewshed can be described as *foreground* (generally within 0.25 to 0.5 miles of the viewer), *middleground* (between the foreground and 3 to 5-miles distant), and *background* (beyond 3 to 5 miles). Because of the built nature of its surroundings and the location of nearby structures, the Potrero Switchyard site would generally be visible in the immediate foreground (0–300 feet) and intermittently visible in the foreground (300 feet to 0.5 miles) distance zones.

For the purpose of this analysis, the potential effect on foreground viewshed conditions is emphasized, particularly those areas within 0.25 miles of the switchyard site. Beyond 0.5 miles, the site would be only intermittently visible as a component within an existing built environment.

View distances are restricted by intervening structures, landforms, and vegetation. From many locations within the area surrounding the site, views of the proposed switchyard facilities will be partially or fully screened by intervening structures.

As described below, the Proposed Project would be visible from some locations along nearby public roads, including I-280, and the chief viewers would be motorists. Illinois Street between 17th Street and Cesar Chavez is a part of the Bay Trail route and is identified as *unimproved (on street) no bike lanes or sidewalks* (Bay Trail, 2011). Cyclists constitute a small viewer group, but both trail hikers and cyclists may become a larger group in the future. Project visibility from residential areas on Third Street (approximately 700 feet west of the site) and farther west would be limited by intervening buildings and street trees.

Current nighttime lighting in the project area includes street lighting on roadways and lighting at the existing Potrero Switchyard and on other facilities.

Figure 5.1-1 shows the location of the switchyard site relative to its surroundings and indicates the eight viewpoints for the photographs provided in Figure 5.1-2. Figure 5.1-2 consists of four sheets presenting photographs from these various viewpoints. There are two images per sheet.

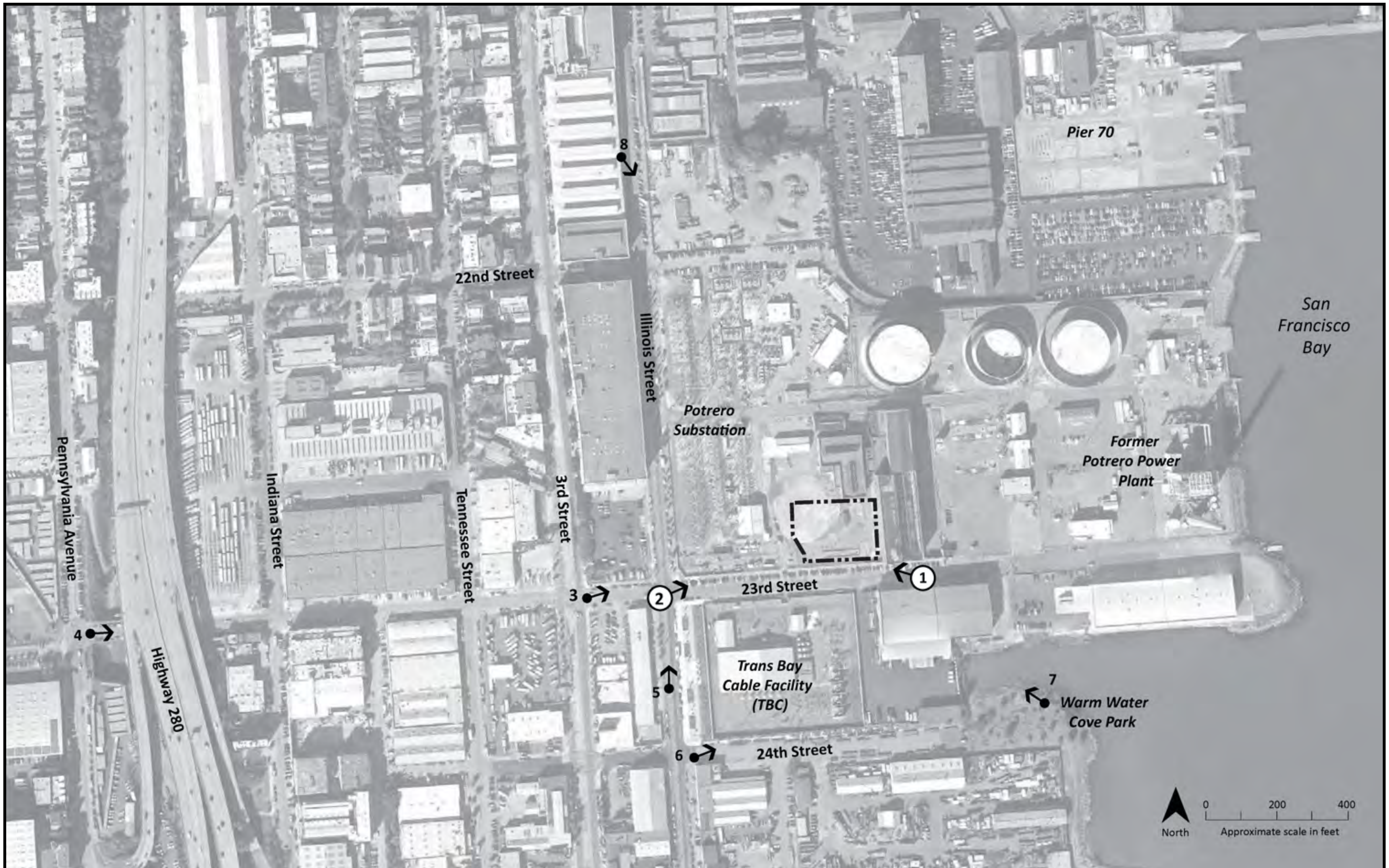
- Photograph 1, approximately 150 feet east of the proposed switchyard site, is a view looking northwest from 23rd Street toward Illinois Street. The project site is located behind the chain link fence in front of which vehicles are parked. A tall red-brick building (Station A of the former power plant) on the right and a light metal building on the left generally frame the site on its east and west sides, respectively. A pole-mounted overhead light is within the project site (PG&E, 2012 pg. 3.1-7). Street trees and a multi-story building on Illinois Street as well as components of the existing Potrero Switchyard are partially visible behind the new 230 kV Switchyard site. Potrero Hill appears beyond these, including trees and residences on the hillside. This viewpoint is used in Figure 5.1-3 to compare existing and simulated proposed conditions.
- Photograph 2, a view looking northeast from the intersection of 23rd and Illinois Streets, shows part of the existing Potrero 115 kV Switchyard, including an existing metal building and a gray concrete wall bordering the sidewalk in the foreground (PG&E, 2012 pg. 3.1-12). This is a view looking toward the site in the opposite direction of Photograph 1. Beyond the existing switchyard, the proposed switchyard site is visible along 23rd Street, with a multi-story brick industrial building (Station A) marking the eastern edge of the site and serving as a backdrop. At the far right in the photo, the stack of the former Potrero Power Plant is silhouetted against the sky. A portion of the landscaped Trans Bay Cable facility perimeter wall also is visible. This viewpoint is used in Figure 5.1-4 to compare existing and simulated proposed conditions.
- Photograph 3 is a view looking toward the project site from the crosswalk at 23rd and Third Streets, one block farther west along 23rd Street from the Photograph 2 viewpoint. This is an active pedestrian and bicycle area (PG&E, 2012 pg. 3.1-12). This view depicts the existing Potrero 115 kV Switchyard and the proposed switchyard site located in the vacant area in front of the red brick building (Station A) and just past the grey metal building. This view includes utility poles, a light colored low-rise storage building situated along the south (right) side of 23rd Street, the stack of the former Potrero Power Plant, and a view toward the East Bay in the background, at the end of the extension of 23rd Street.
- Photograph 4 is a view toward the site from approximately 0.4 miles west on 23rd Street at Pennsylvania Avenue, just west of I-280 (PG&E, 2012 pg. 3.1-12). The bridge structure carrying I-280 is visible at the top edge of the photograph. From this slightly elevated vantage point, the switchyard site is discernible but largely screened by intervening buildings. The stack of the former Potrero Power Plant is visible in the background, beyond the tall Station A building. The upper reaches of the new switchyard building would be visible at approximately the height of the darker red color on the wall of Station A.

- Photograph 5, looking north on Illinois Street between 23rd and 24th Streets, shows development along both sides of Illinois Street (PG&E, 2012 pg. 3.1-12). On the right, existing Potrero 115 kV Switchyard is a prominent feature, with its equipment seen above a light gray wall. In the immediate foreground are landscape improvements in front of the Trans Bay Cable facility and a portion of the screening wall parallel 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.
- Photograph 6 shows the view from Illinois Street looking east along 24th Street in the direction of the waterfront (PG&E, 2012 pg. 3.1-12). This location is one block south of the project site. Views toward PG&E's switchyard site are completely blocked by the masonry walls that surround the Trans Bay Cable facility. Poles and structures within the facility and the more distant stack of the former Potrero Power Plant appear silhouetted against the sky. Trees at Warm Water Cove Park are visible at the end of 24th Street. A very small green and yellow sign that denotes Bay Trail shoreline access can be seen on the right side of the street, near the chain link fence.
- Photograph 7 was taken from the waterfront path in Warm Water Cove Park, approximately 600 feet southeast of the site (PG&E, 2012 pg. 3.1-12). It illustrates that views toward the project site are completely screened by the multi-story white DHL warehouse building on 23rd Street, across from the site. The site is west of the red-brick Station A building, partially visible beyond the DHL building. Open, panoramic views of the bay are available to the east of this location along the shoreline path; however, buildings, tanks, utility towers, and various other industrial structures dominate views in other directions.
- Photograph 8, taken from Illinois Street north of 22nd Street, is a view looking southeast toward the proposed switchyard site (PG&E, 2012 pg. 3.1-12). Opaque fences and intervening buildings at or near the existing Potrero Switchyard generally screen views of the project from this location. Utility structures, including lattice towers and portions of the existing Potrero Switchyard, are 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.

Sensitive Viewers

There are three primary types of potentially affected viewers within the project viewshed: motorists, residents, and recreational users.

Motorists, the most numerous viewers in the area, include people traveling on Illinois and 23rd Streets and on Third Street, a major north-south road and local transportation corridor. Because of intervening buildings, walls, and vegetation, motorist views toward the project from Third Street are limited. While the traffic volumes on Third Street are relatively high, fewer vehicles use other public streets near the project, although Illinois Street is a north-south connector route (SFMTA, 2013) along the waterfront. 23rd Street dead-ends east of the existing Potrero Switchyard and the proposed Potrero 230 kV Switchyard site and has limited traffic, mostly trucks involved at work sites, including the former Potrero Power Plant and the DHL facility, and occasional customers at the DHL facility (PG&E, 2012 pg. 3.1-12). Affected motorist views are generally brief, typically lasting less than a few minutes. Viewer sensitivity is considered low to moderate.



Viewpoint Location and Direction

Simulation Viewpoint Location and Direction

New Potrero 230 kV Switchyard Site

Source: PG&E, 2012.

Figure 5.1-1

Photograph Viewpoint Locations

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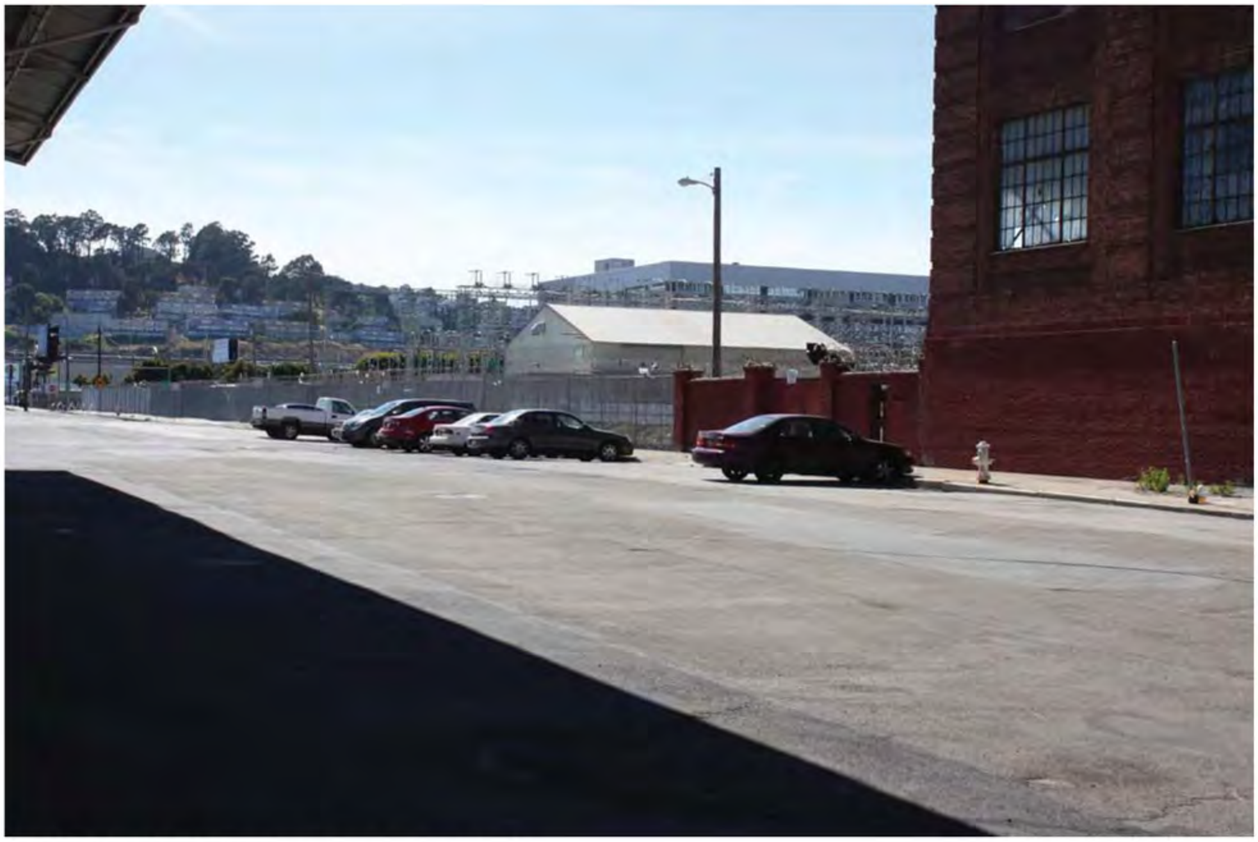

1. 23rd Street east of Illinois Street looking west*

2. 23rd Street at Illinois Street looking northeast*

*Simulation Viewpoint

Source: PG&E, 2012.

Figure 5.1-2a

Photographs of the Potrero Switchyard Site
Sheet 1 of 4

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3. 23rd Street at 3rd Street looking northeast

4. 23rd Street at Pennsylvania Avenue looking east

Source: PG&E, 2012.

Figure 5.1-2b

Photographs of the Potrero Switchyard Site
Sheet 2 of 4

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5. Illinois Street near 24th Street looking north

6. 24th Street at Illinois Street looking northeast

Source: PG&E, 2012.

Figure 5.1-2c

Photographs of the Potrero Switchyard Site
Sheet 3 of 4

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7. Warm Water Cove Park looking northwest

8. Illinois Street north of 22nd Street looking southeast

Source: PG&E, 2012.

Figure 5.1-2d

Photographs of the Potrero Switchyard Site
Sheet 4 of 4

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The second viewer group includes nearby residents. The immediate site vicinity is primarily industrial and commercial. The closest residences are west of Third Street, approximately 700 feet from the site; however, from this area views toward the site are obstructed by existing structures and street trees. Residences located approximately 0.5 miles away, on the eastern slope of Potrero Hill, may have distant views of the project. From these residences, the project would appear within the context of existing industrial and utility development, including the existing Potrero Switchyard, former power plant, screening wall, tanks, and the Trans Bay Cable facility. Views of the bay would not be affected. Residential views tend to be long duration, and the sensitivity of this viewer group is considered moderate to high.

The third viewer group includes recreational users, including cyclists and pedestrians using Illinois Street and the Bay Trail. Viewers using Illinois Street would have a close view of the proposed Potrero 230 kV Switchyard, but project components would appear within the context of industrial and utility development including the existing Potrero Switchyard and the Trans Bay Cable facility. The view toward the site from the nearest public open space, Warm Water Cove Park, is blocked by existing 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; however, direct views would be blocked by the existing DHL facility and the red-brick Station A building. Recreational views in the project area would tend to be brief or moderate in duration, and the sensitivity of this viewer group is considered moderate to high.

Applicable Regulations, Plans, and Standards

Federal

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

State

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 as scenic highways or have been designated as such. The status of a state scenic highway changes from eligible to officially designated (OD) 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 (PG&E, 2012). A city or county may propose adding routes with outstanding scenic elements to the list of eligible highways (Caltrans, 2007).

No designated state scenic routes are located near the project. Highway 80, an eligible state scenic highway, lies directly over the HDD portion of the underground route. Highway 280, an eligible state scenic highway, lies 0.33 miles west of the proposed Potrero Switchyard site; however, intervening buildings screen most views of the site from this roadway and available views would be fleeting and seen in the context of the surrounding industrial and commercial buildings and structures.

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 San Francisco Bay. It regulates nearly all work on land within 100 feet of the bay shoreline. BCDC also is the designated state coastal management agency for the San Francisco Bay segment of the California coastal zone. The proposed switchyard site would be located outside BCDC jurisdiction, but 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.

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)

Port of San Francisco. 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 existing switchyard site is located in proximity to the Port's Southern Waterfront Subarea Plan, and a portion of the proposed switchyard site would be within the Port's jurisdiction, this discussion considers relevant Port policies, including the Pier 70 Preferred Master Plan.

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)

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.

Port of San Francisco, Pier 70 Preferred Master Plan. Pier 70 is located northeast of Potrero Switchyard. As part of development at Pier 70, 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 proposed switchyard site would be outside the planning area for the Pier 70 Preferred Master Plan. Existing infrastructure along the shoreline blocks direct views of the Potrero Switchyard site.

Local

The Proposed Project would be located in areas cooperatively administered by the City and County of San Francisco, the Port of San Francisco, and the BCDC. 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.

San Francisco General Plan, 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.
>
> Policy 3.1.5. Respect public view corridors.
>
> Policy 3.2.3. Minimize the visual impact of parking.
>
> 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 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. Once constructed, the project will not block views down 23rd Street toward the waterfront, nor will it result in an increase in permanent parking that would be visible to the public.

> 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 former Potrero Power Plant site and Pier 70, the area surrounding Irish Hill also is identified as a potential park site. Currently, this area is owned by PG&E and is used for company operations. 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.

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, a private, not-for-profit marketing organization promotes the drive, which is marked by signs maintained by the San Francisco Municipal Transportation Agency. 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.

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including the project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study. Table 5.1-1 identifies the APM applicable to aesthetics.

Table 5.1-1. Applicant Proposed Measures (APMs) Related to Aesthetics

APM Number	Issue Area
	Aesthetics
APM 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.

5.1.2 Environmental Impacts and Mitigation Measures

Visual Impact Assessment Methodology

When viewing a particular landscape, people may differ in their responses to that landscape and any proposed visual changes. These are based on their values and their familiarity, concern, or expectations for that landscape and its scenic quality. Because each person's attachment to and valuation of a particular landscape is unique, visual changes affect viewers differently. Nevertheless, generalizations can be made about viewer sensitivity to scenic quality and visual change. For example, recreationists, pedestrians, and people driving for pleasure are expected to have a high concern for scenery, visual quality, and landscape character. By comparison, persons commuting regularly through the same landscape generally have a moderate concern for scenery, while people working at, say, industrial sites generally have a lower concern for scenic quality or changes to existing landscape character. The visual sensitivity of a landscape to change is affected by the viewing distances from which it is seen. The visual sensitivity of a landscape also is affected by the speed at which a person is traveling through the landscape (e.g., high speed on a highway, low speed walking, or stationary at a residence).

The visual analysis is based on review of information provided by PG&E, including project maps and drawings, aerial and ground level photographs of the project area, local planning documents, and computer-generated visual simulations. Field observations and photography were conducted by PG&E consultants in May and June 2012 to document existing visual conditions in the project area and to identify potentially affected sensitive viewing locations. Visual conditions were verified in the field by CPUC in January 2013.

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 would be visible to the public. To document the visual change that would occur, visual simulations presented before and after images showing the project from key representative public viewpoints. The visual impact assessment is based on evaluation of the changes to the existing visual resources that would result from construction and operation of the project. These changes were assessed, in part, by evaluating the after views and comparing them to the existing visual environment.

The analysis used a Visual Sensitivity/Visual Change methodology to assess the visual effects of the Proposed Project on the existing landscape. The methodology includes a characterization of the visual sensitivity of the existing landscape, the characteristics of existing visual changes occurring and apparent in the landscape, and the characteristics of the Proposed Project.

Visual sensitivity consists of three components: visual quality, viewer concern, and viewer exposure. The description of *visual quality* notes the existing built structures and natural landscape features that contribute to overall visual quality. *Viewer concern* can be described as the personal expectations for the landscape that are held by the viewing public. Viewer concern often is reflected in public policy documents that identify landscapes of special concern or roadways with special scenic status, e.g., scenic highways. *Viewer exposure* also affects a landscape's overall visual sensitivity. Landscapes that have very low viewer exposure, based on landscape visibility, viewing distance, number of people who view the landscape, or duration of time that the landscape can be viewed, will tend to be less sensitive to overall visual change in the context of human experience of visual impacts. Landscapes with higher viewer exposure are more sensitive to overall visual changes. Overall visual sensitivity is rated on a scale of Low to Moderate to High.

Project-induced *visual change* could result from aboveground facilities, vegetation removal, landform modification, size or scale of project components relative to existing landscape characteristics, and the placement of project components relative to developed features. The experience of visual change also can be affected by the degree of available screening by vegetation, landforms, and/or structures; distance from the observers; atmospheric conditions; and angle of view. Visual change describes the degree of actual visible change expected as a result of the project. The fundamental elements of visual change include *visual contrast, visual dominance,* and *scenic view obstruction*. *Visual contrast* refers to visual discrepancies of form, line, color, or texture of the project against the existing landscape. *Visual dominance* refers to the degree to which this contrast would demand the attention of casual viewers. *Scenic view obstruction* refers to the degree to which the project would block or intrude upon scenic view corridors, particularly those identified in public policies. Overall visual change is rated on a scale of Low to Moderate to High.

In addition, the project is evaluated for conformance with applicable local plans and policies. Adopted expressions of local public policy pertaining to visual resources are given great weight in determining both visual quality and viewer concern.

The determination of which aesthetic changes cross a threshold of "substantial adverse effect" or degradation is based upon the criteria described above and in Table 5.1-2, Visual Impact Significance Criteria. This table was used primarily as a consistency check, as determinations of visual sensitivity and visual change were based primarily on analyst experience and site-specific circumstances.

Implicit in this rating methodology is the acknowledgment that for a visual impact to be considered significant two conditions generally must exist: (1) the existing landscape is of reasonably high quality and is relatively valued by viewers; and (2) the perceived incompatibility of one or more elements or characteristics of the project tends toward the high extreme, leading to a substantial reduction in visual quality.

Table 5.1-2. Visual Impact Significance Criteria

Visual Sensitivity	Visual Change: Low	Low to Moderate	Moderate	Moderate to High	High
Low	No impact[1]	No impact	Less Than Significant[2]	Less Than Significant	Less Than Significant
Low to Moderate	No impact	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant with Mitigation Incorporated[3]
Moderate	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant with Mitigation Incorporated	Less Than Significant with Mitigation Incorporated
Moderate to High	Less Than Significant	Less Than Significant	Less Than Significant with Mitigation Incorporated	Less Than Significant with Mitigation Incorporated	Potentially Significant Impact[4]
High	Less Than Significant	Less Than Significant with Mitigation Incorporated	Less Than Significant with Mitigation Incorporated	Potentially Significant Impact[4]	Potentially Significant Impact

1 - No Impact – Impacts may or may not be perceptible but are considered minor in the context of existing landscape characteristics and view opportunity.
2 - Less Than Significant – Impacts are perceived as negative but do not exceed environmental thresholds.
3 - Less Than Significant with Mitigation Incorporated – Impacts are perceived as negative and may exceed environmental thresholds depending on project and site-specific circumstances, but are Less Than Significant with mitigation incorporated.
4 - Potentially Significant Impact – Impacts with feasible mitigation may be reduced to levels that are not significant or avoided all together. Without mitigation, significant impacts would exceed environmental thresholds.

Project Components

The impact assessment methodology takes into account all components of the Proposed Project, including construction. Although the proposed transmission line components would be underground or underwater, installation would involve various pieces of equipment. Installation of the submarine cable would involve a barge pulled into position by two commercial tugboats. The submarine installation is expected to take approximately two weeks. The vessels would be similar in nature to the vessel traffic already existing on the bay. Underground installation of the transmission line on land and in transition between land and bay bottom would require cut and fill excavation work in existing roadways and use of a HDD site to bore between the end of the excavation and the submarine cable. The landside work would require the temporary placement of equipment, tanks, safety barriers, and similar appurtenances in the landscape during the construction phase. Once installed, the transmission line would be underwater or underground accessible by manholes and vaults in the city streets. Because of this, aesthetic impacts of the installation of the submarine and underground cable are not discussed further, as the use of various equipment or marine vessels would be short-term and common to existing vessel traffic and construction equipment in the area.

The primary permanent visible component of the project would be the new 230 kV switchyard building, proposed to be adjacent to the existing Potrero Switchyard. This new facility would be located within the existing fenceline of the property and would be housed in an estimated 8,500-square-foot building with basement. The approximate dimensions of the major project components are listed in Table 5.1-3. The 23rd Street frontage of the site would include an entry gate and 10-foot-tall masonry wall that would partially screen outdoor components. To convey power between the 115 kV and 230 kV switchyards, six single-phase tubular steel termination poles would be installed. These would be approximately 10 feet high, with insulated terminals to a total height of approximately 17 feet. The new poles would likely be at the south end of the existing 115 kV bus, near 23rd Street. The height of the existing 115 kV bus structure is approximately 34 feet. These poles would be a minor element in the project and would blend with the existing bus equipment on-site.

Table 5.1-3. Approximate Dimensions of Major Project Components

Components (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

Source: PG&E, 2012.

The new switchyard would potentially include outdoor lighting for safety and security purposes. Like the existing lighting at the switchyard and substation, the new lighting would be operated only for safety and security purposes. New project lighting would be designed to avoid casting light or glare offsite.

Visual Simulations

Visual simulations were prepared to illustrate "before and after" visual conditions in the Proposed Project area, as seen from the two simulation viewpoints (VP) shown on Figure 5.1-1. These simulations are presented in Figures 5.1-3 and 5.1-4; each of these figures consists of two full-page images designated "a" and "b," with the existing "before" views shown in the "a" figure and the "after" visual simulations in the "b" figure. Of 8 viewpoints considered (see Figures 5.1-1 and 5.1-2), these two Viewpoints (VPs) were identified as representative of views seen by the greatest number of affected viewers and/or from sensitive locations, such as nearby streets.

VP-1: Close-range View from 23rd Street. Figure 5.1-3a is a close-range view of the proposed Potrero 230 kV Switchyard site as seen from 23rd Street, approximately 150 feet east of the site. In this view, the site lies beyond the chain link fence near the center of the view. A pole-mounted overhead light is near the corner of the site and beyond it a metal building and portions of the existing 115 kV 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. From this location, on the right, a multi-story brick building (Station A) screens views to the north. Street trees along Third Street, a multi-story warehouse, and trees and residences on Potrero Hill appear in the background.

Figure 5.1-3b shows the same view with a simulation of how the wall and structure proposed to be constructed would appear. Planned landscape vegetation along the wall is shown.

Viewer Exposure. Low. Because 23rd Street dead-ends just east of this vantage point, a limited number of people experience the view from this vantage point. If future public open space or shoreline access improvements occur, the number of viewers could increase but direct views from the waterfront would be blocked by existing structures.

Viewer Concern. Low to Moderate. Travelers on 23rd Street already experience the industrial nature of the existing Potrero Switchyard, the new Trans Bay Cable facility, and the former Potrero Power Plant. The visual quality of this viewpoint is industrial in nature. Therefore, travelers can be expected to have low-to-moderate concern for visual impacts resulting from the new switchyard. If future public open space or shoreline access improvements occur, the viewer concerns could increase.

Visual Quality: Low to Moderate. The primary focal points of this landscape are the existing Potrero 115 kV Switchyard, the new Trans Bay Cable facility, warehousing, and the former Potrero Power Plant which is a brick building (Station A) with a historical feel. A group of tall trees in the background and housing on Potrero Hill provide some interest in the distance from this Viewpoint. All of these visual attributes combine to create a visual quality that is low-to-moderate.

Overall Visual Sensitivity: Low to Moderate. For travelers on 23rd Street and from KVP-1 specifically, the low viewer exposure, low-to-moderate viewer concern, and low-to-moderate visual quality lead to a low-to-moderate overall visual sensitivity of the visual setting and viewing characteristics of the Potrero Switchyard site.

Visual Change: Low to Moderate. The visual simulation portrays the proposed Potrero 230 kV Switchyard, including the southern façade of the building that encloses most of the individual switchyard elements, and the masonry screening wall and entry gate from 23rd Street (Figure 5.1-3b). From this view location, the new building would partially screen views of the existing Potrero Switchyard and the multi-story warehouse beyond. The scale and appearance of the new building at the switchyard would be compatible with the existing visual character found in the project vicinity. In addition, the new wall would screen the lower portions of the new switchyard. Given the presence of nearby existing utility and industrial facilities, the introduction of the new 230 kV Potrero Switchyard would not have a substantial effect on overall character or composition of the urban landscape in this area.

Referring to Table 5.1-2, Visual Impact Significance Criteria, the overall visual change seen from 23rd Street would be low-to-moderate and in the context of the existing landscape's low-to-moderate visual sensitivity, the proposed Potrero 230 kV Switchyard would result in a less-than-significant impact to aesthetic or visual resources.

VP-2: View from 23rd Street at Illinois Street. Figure 5.1-4a provides a wide-angle view from 23rd Street at Illinois Street looking northeast toward the site. This vantage point provides a close-range, relatively unobstructed view of the existing 115 kV Potrero Switchyard in the left half of the image and the proposed new switchyard site beyond it, as seen by a passing motorist, pedestrian, or cyclist. From this location, the project site is visible along 23rd Street, beyond the visible elements of the existing 115 kV Potrero Switchyard, including its steel power structures, metal building, and concrete wall. A multi-story brick building (Station A) lies approximately at the eastern edge of the project site. Silhouetted on the far right is the stack of the former Potrero Power Plant, with a portion of the wall of the Trans Bay Cable facility visible in the foreground.

Viewer Exposure. Low to Moderate. Because there is no screening provided by landforms or vegetation from this viewpoint, the proposed 230 kV Potrero Switchyard would be highly visible in the landscape as seen from this location. Illinois Street is a two-way, two-lane local road that that has low-to-medium traffic. Therefore, the number of viewers on Illinois Street is considered low to moderate. For motorists, the duration of view would be brief because of the speed of travel and intervening built features including the existing Potrero Switchyard. Cyclist and pedestrian views of the new Switchyard would be longer in duration than motorists, but relatively few people would be expected to travel on Illinois Street by foot or bicycle. Based on the combination of all these factors and conditions, the overall viewer exposure for VP-2 is considered low to moderate.

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

Aspen Environmental Group

Source: PG&E, 2012.

Figure 5.1-3a

Existing View from 23rd Street East of Illinois Street

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Visual Simulation of Proposed Project (VP 1)

Source: PG&E, 2012.

Figure 5.1-3b

Visual Simulation from 23rd Street East of Illinois Street

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

Source: PG&E, 2012.

Figure 5.1-4a

Existing View from 23rd Street at Illinois Street

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Visual Simulation of Proposed Project (VP 2)

Aspen Environmental Group

Source: PG&E, 2012.

Figure 5.1-4b

Visual Simulation from 23rd Street at Illinois Street

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Viewer Concern. Low to Moderate. Travelers on Illinois Street already experience the industrial nature of the existing 115 kV Potrero Switchyard, the former Potrero Power Plant, and the new Trans Bay Cable facility on a regular basis. The existing visual quality of this viewpoint is industrial in nature. Therefore, travelers can be expected to have low-to-moderate concern for visual impacts resulting from the new switchyard.

Visual Quality: Low to Moderate. The primary focal points of this landscape are the 115 kV Potrero Switchyard, the large former Potrero Power Plant building, and the Trans Bay Cable facility. Views of the bay are restricted due to intervening structures. All of these visual attributes combine to create a visual quality that is low-to-moderate.

Overall Visual Sensitivity: Low to Moderate. For travelers on 23rd Street and from VP-2 specifically, the low to moderate viewer exposure, low to moderate viewer concern, and low to moderate visual quality lead to a low to moderate overall visual sensitivity of the visual setting and viewing characteristics of the 230 kV Potrero Switchyard site.

Visual Change: Low to Moderate. The visual simulation from this location (Figure 5.1-4b) 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 would be slightly visible beyond the switchyard wall. As seen from this intersection, the new switchyard building and the nearby existing metal building would be similar in terms of scale and form. As such, the overall appearance of the proposed switchyard building would be compatible with the existing visual character found in the project vicinity. The project-related changes are incremental effects that would not substantially alter existing visual conditions in the area, including views toward the waterfront.

Referring to Table 5.1-2, Visual Impact Significance Criteria, the overall visual change seen from 23rd Street would be low-to-moderate and in the context of the existing landscape's low-to-moderate visual sensitivity.

Aesthetics Impacts

a. Would 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 views of the San Francisco Bay from the Warm Water Cove Park represent a scenic vista. Panoramic views of the San Francisco Bay would also be available from the expanded Warm Water Cove north portion, just east of the former Potrero Power Plant (Central Waterfront Area Plan, Eastern Neighborhoods Streets and Open Space Concept, 2008). The proposed transmission line would be located approximately 600 feet northwest of the Warm Water Cove Park but would not be visible from this location, as illustrated in Figure 5.1-2d (Photograph 7). Additionally, the project would not be directly visible from the Warm Water Cove expansion due to intervening structures, including the former Potrero Power Plant and existing DHL facility. Therefore, the project would not have an adverse effect on a scenic vista.

b. Would 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 in the immediate vicinity of the Proposed Project. Highway I-80, an eligible state scenic highway lies directly over the proposed northern HDD transition area and underground route. Portions of the construction along Spear Street may be momentarily visible from vehicles on I-80 during construction. Following construction, there would be no potential to damage scenic resources and no visual impact at this location.

Highway I-280, an eligible state scenic highway, lies 0.33 miles west of the proposed Potrero Switchyard site. The proposed switchyard would be partially visible against the backdrop of the former Potrero Power Plant as indicated in Figure 5.1-2b (Photograph 4). Because of the existing industrial infrastructure and intervening structures, the proposed Potrero 230 kV Switchyard would not damage scenic resources from this viewpoint, and there would be no impact at this location.

c. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

LESS THAN SIGNIFICANT – CONSTRUCTION. During construction, the Proposed Project would result in temporary impacts that would degrade the existing visual character or quality of the site and surroundings along Folsom Street, Spear Street, and near the Potrero Switchyard. During construction, potential visual impacts would include the presence of workers, temporary structures, construction equipment, and vehicles associated with the installation of the transmission line and switchyard components. Trenching activity would progress at approximately 50 feet per day along the along the onshore segment. Within the four month period of trench excavation and manhole installation along Folsom and Spear Streets, trenching within 100 feet of any single location would be limited in duration to about four days as crews would gradually move along the linear work zone. Installation of the HDD offshore to onshore transition would require work during an 8-month window. Within this window, the drill rig would typically require 13 days per each of three bores, drilled separately, for a total of 39 days of drill rig use in each transition area. At each HDD transition area, the drilling would run up to 6 days per week and 10 hours per day, extending over a period of about 6 to 7 weeks. The underground route and HDD locations would be within public streets adjacent to residential and commercial uses, as shown in Figure 4-8.

As noted in the Project Description (Section 4.11.1), during underground trenching activities the excavated materials would be disposed directly into trucks and removed from the area for off-site disposal. Any water from dewatering would be pumped into containment tanks and tested. Landscaping or vegetation that may need to be cleared would be replaced, and trash and litter would be collected in bins or appropriate containers. After construction is completed, all work areas would be restored to conditions equal or better than pre-construction conditions. Because the visible construction activities would be temporary in nature and the construction sites would be organized and orderly, construction-related visual effects of the underground transmission line and HDD installations would be less than significant.

Construction of the new Potrero 230 kV Switchyard would take approximately 8 months. The switchyard would be located adjacent to a public street (23rd Street) in an urban area where industrial activities typically employ trucks and other equipment. There are no residences or other sensitive visual receptors adjacent 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 would be less than significant.

LESS THAN SIGNIFICANT – OPERATION AND MAINTENANCE. Once constructed, the entire transmission line would be underground and submarine and would not affect the visual character of its surroundings. The underground portion of the line would be inspected regularly from inside the vaults to avoid disturbing traffic using city streets and would not result in visual effects.

The project would involve the introduction of the new Potrero 230 kV Switchyard on a previously disturbed vacant site adjacent to the existing Potrero Switchyard. This visual change would not be particularly noticeable to the public given the primarily industrial urban setting that includes the Trans Bay Cable facility, former power plant facility, large storage tanks, overhead utility lines, and multi-story industrial and warehouse buildings.

Close-range, unobstructed views of the switchyard would occur from limited places along 23rd Street within a block of the switchyard site; however, as described for the visual simulations depicted in Figures 5.1-3a through 5.1-4b, the project represents an incremental visual change to the urban landscape setting. The project would not obstruct views to the bay. Overall, the changes brought about by the project would not degrade the existing visual character or quality of the landscape. While the Potrero Switchyard building would be visible from some vantage points, the overall visual change would be low-to-moderate and in the context of the existing landscape's low-to-moderate visual sensitivity, the proposed Potrero 230 kV Switchyard would result in a less than significant impact to aesthetic or visual resources.

d. Would 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 – CONSTRUCTION. During any night-time construction, portable lighting would be in place. This would be at sites where directional drilling or other night-time work would take place, if required. This is typical of night construction in urban streets. Construction would require lighting focused on the work area for safety and visibility. The effect would be temporary and would be located in an urban environment and primarily industrial setting with existing nighttime lighting in the surrounding area from sources such as street lights and commercial and industrial facility lighting. Therefore, construction impacts would be would be would be less than significant.

LESS THAN SIGNIFICANT – OPERATION AND MAINTENANCE. The project site would include a neutral-colored concrete perimeter screening wall set back to allow for new landscaping and a new building that would be painted a light neutral color with a non-reflective finish (see Figure 5.1-3b and 5.1-4b for visual simulations of the switchyard building and wall). Additional switchyard structures would have a galvanized finish that weathers to a dull, non-reflective patina. The project design characteristics would minimize potential effect of glare.

The project would be located in an urban, primarily industrial setting with existing overhead lighting adjacent to the site (see Figure 5.1-3) and localized lighting sources such as street lights and commercial and industrial facility lighting. Specifically, the new 230 kV Potrero Switchyard would be located on land owned by GenOn Energy, Inc., and part of the former Potrero Power Plant site. Adjacent land uses include commercial facilities, a storage facility, and the Trans Bay Cable facility. Few sensitive viewers are expected in the immediate area when night lighting would be utilized. Within this context, new switchyard lighting would represent a minor incremental change to existing nighttime lighting conditions. In addition, PG&E would implement APM AE-1 that would design new outdoor lighting to incorporate measures to reduce spillover into areas outside the switchyard site and minimize the visibility of lighting from offsite locations. APM AE-1 also notes that the new lighting would be operated only as needed. Given the industrial nature of the area and existing night lighting sources in the vicinity of the switchyard, the potential impact of light or glare would be less than significant.

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5.2 Agriculture and Forestry Resources

AGRICULTURE AND FORESTRY RESOURCES In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. **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?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

5.2.1 Setting

The Proposed Project would be within the City and County of San Francisco, within city streets and partially in the San Francisco Bay. Maps from the California Department of Conservation Farmland Mapping and Monitoring Program (DOC, 2011), Williamson Act Program (DOC, 2010), and San Francisco General Plan (San Francisco Planning Department, 2012) provide evidence that there are no agricultural or forestry lands in the project area. Potential impacts on recreational and commercial fishing are addressed in Sections 5.4 (Biological Resources) and 5.15 (Recreation).

Regulatory Background

California Farmland Mapping Program. The California Department of Conservation (DOC) established the Farmland Mapping and Monitoring Program (FMMP) in 1982 to assess the location, quantity, and quality of agricultural lands and conversion of these lands to other uses. Every even-numbered year, FMMP issues a Farmland Conversion Report. FMMP data are used in elements of some county and city general plans, in regional studies on agricultural land conversion, and in environmental documents as a way of assessing project-specific impacts on Prime Farmland. The City and County of San Francisco does not participate in the farmland mapping program.

Williamson Act. The Williamson Act, or California Land Conservation Act (California Government Code Section 51200 et seq.), is designed to preserve agricultural and open space land. It allows private landowners to enroll in contracts that voluntarily restrict land to agricultural and open space uses. In return, Williamson Act parcels receive a lower property tax rate consistent with agricultural and open space use instead of their market rate value. The County of San Francisco does not participate in the Williamson Act Program (California Department of Conservation, 2010).

San Francisco General Plan. The San Francisco General Plan does not have Agricultural or Forestry Elements because there are no agricultural or forest lands within the City. Although the City allows small-scale urban agriculture (Planning Code Amendment on Urban Agriculture, Ordinance 66-11), there are no local regulations pertaining to agricultural or forest resources that are applicable to the project.

Applicant Proposed Measures

There are no Applicant Proposed Measures for agriculture and forestry resources.

5.2.2 Environmental Impacts and Mitigation Measures

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 California Department of Conservation's (DOC) Farmland Mapping and Monitoring Program (FMMP) does not include any designated Farmland in the City and County of San Francisco. Therefore, there would be no impact.

b. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

NO IMPACT. The City and County of San Francisco does not participate in the Williamson Act. Although San Francisco allows small-scale urban farming, there is no designated zoning for agricultural use, and the San Francisco General Plan does not include an Agriculture Element. Therefore, there would be no impact.

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 designated forest land or timberland in the vicinity of the Proposed Project. Therefore, there would be no impact.

d. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

NO IMPACT. Project would not result in any loss or conversion of forest land; therefore, there would be no impact.

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?

NO IMPACT. There is no farmland or forest land in the vicinity of the project, so there would be no impact.

5.3 Air Quality

AIR QUALITY Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. **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?	☐	☐	☒	☐

Significance criteria established by CEQA Guidelines, Appendix G.

5.3.1 Setting

Air Basin

The project would be in the San Francisco Bay Area air basin in the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), which regulates sources of air pollution and the programs to improve air quality in the region. The air basin 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, which allow air to flow in and out of the Bay Area air basin and California's Central Valley (BAAQMD, 2012).

Climate and Meteorology

San Francisco commonly experiences cool, foggy weather in the summer due to its proximity to the ocean and the associated cool air within the marine layer. Because most of San Francisco's topography is below 200 feet, marine air is able to flow easily across most of the City, resulting in relatively lower air pollution potential lower than downwind portions of the region. Pollutant transport occurs from San Francisco to the southern and eastern portions of the region, where pollutants can accumulate (BAAQMD, 2012).

Ambient Air Quality

Ambient air quality is assessed by measuring concentrations of air pollutants in the ambient air. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) are planning standards that define the upper limits for airborne concentrations of pollutants. The standards are designed to protect public health and welfare with a reasonable margin of safety. At the national level, the federal Clean Air Act requires the U.S. Environmental Protection Agency (USEPA) to establish NAAQS and designate geographic areas that are either attaining or violating the standards. In California, air quality management and regulation is the responsibility of the California Air Resources Board (CARB) and local air quality management districts, in this case BAAQMD.

Criteria Air Pollutants. The NAAQS and CAAQS are established for "criteria pollutants." These are ozone, respirable particulate matter (PM10), fine particulate matter (PM2.5), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. Ozone is an example of a secondary pollutant that is not emitted directly from a source (e.g., an automobile tailpipe), but it is formed in the atmosphere by chemical and photochemical reactions. Reactive organic gases (ROG), including volatile organic compounds (VOC), are regulated as precursors to ozone formation. The USEPA and CARB both have independent authority to develop and establish ambient air quality standards, and in general, the CAAQS are more stringent than the corresponding NAAQS. The national and California ambient air quality standards are shown in Table 5.3-1.

Table 5.3-1. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards
Ozone	1-hour 8-hour	0.09 ppm 0.070 ppm	— 0.075 ppm
Respirable Particulate Matter (PM10)	24-hour Annual Mean	50 µg/m^3 20 µg/m^3	150 µg/m^3 —
Fine Particulate Matter (PM2.5)	24-hour Annual Mean	— 12 µg/m^3	35 µg/m^3 15 µg/m^3
Carbon Monoxide (CO)	1-hour 8-hour	20 ppm 9.0 ppm	35 ppm 9.0 ppm
Nitrogen Dioxide (NO_2)	1-hour Annual Mean	0.18 ppm 0.030 ppm	0.100 ppm 0.053 ppm
Sulfur Dioxide (SO_2)	1-hour 24-hour Annual Mean	0.25 ppm 0.04 ppm —	0.075 ppm 0.14 ppm 0.03 ppm

Notes: ppm=parts per million; µg/m3= micrograms per cubic meter; "—" =no standard.
Source: CARB (http://www.arb.ca.gov/research/aaqs/aaqs2.pdf), June, 2012.

Attainment Status and Air Quality Plans. The USEPA, CARB, and local air district work together to classify an area as attainment, unclassified, or nonattainment depending on the historical levels of contaminants measured in the ambient air. Table 5.3-2 summarizes attainment status for the criteria pollutants in the BAAQMD with both the federal and state standards.

Existing Local Air Quality Conditions. Table 5.3-3 shows air quality measurements at the nearest air quality monitoring site to the project area (Arkansas Street). This station, located in the Potrero Hill neighborhood west of the Proposed Project route, provides data that are representative of the project area.

Table 5.3-2. Attainment Status for BAAQMD

Pollutant	Federal Designation	State Designation
Ozone (1-hour)	No Federal Standard	Nonattainment
Ozone (8-hour)	Nonattainment	Nonattainment
PM10	Attainment/Unclassified	Nonattainment
PM2.5	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment

Source: BAAQMD; http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm.

Ozone. Adverse health effects of ozone include: aggravation of respiratory and cardiovascular diseases; reduced lung function; and increased cough and chest discomfort (BAAQMD, 2012). Ambient levels of ozone throughout the BAAQMD have generally improved since recordkeeping began, although peak concentrations in San Francisco have remained steady (CARB, 2013). Days exceeding the standards are generally attributed to high levels of ozone precursor emissions during the warm summer months. Motor vehicle emissions, industrial emissions, and high ambient temperatures that occur in the inland portions of the BAAQMD contribute to summertime ozone formation and subsequent occasional violations of the standards. In San Francisco, ozone concentrations do not commonly exceed the standards.

Table 5.3-3. Summary of Ambient Air Quality Monitoring Data in San Francisco

Pollutant	Averaging Time	2009	2010	2011
Ozone (ppm)	1-Hour	0.072	0.079	0.070
	8-Hour	0.057	0.051	0.054
PM10 (µg/m^3)	24-Hour	36.0	39.7	45.6
	Annual Arithmetic Mean	18.6	—	19.5
PM2.5 (µg/m^3)	24-Hour	**35.5**	**45.3**	**47.5**
	Annual Arithmetic Mean	—	10.5	9.5
CO (ppm)	1-Hour	—	—	—
	8-Hour	2.86	1.37	1.20
NO_2 (ppm)	1-Hour	0.059	0.093	0.093
	Annual Average	0.015	0.013	0.014

All data are from the Arkansas Street monitoring station; SO_2 is not monitored. **Bold** text indicates figure exceeds an air quality standard.
Notes: ppm=parts per million; µg/m^3= micrograms per cubic meter; "—" = insufficient data.
Source: CARB 2013; http://www.arb.ca.gov/adam/topfour/topfour1.php.

Particulate Matter. Adverse health effects of particulate matter include: reduced lung function; aggravation of respiratory and cardiovascular diseases; increases in mortality rate; and reduced lung function growth in children (BAAQMD, 2012). Long-term average concentrations of inhalable PM10 and PM2.5 have remained relatively constant in the BAAQMD since recordkeeping began (CARB, 2013). PM10 is generated within the project area largely as a result of wind during dry conditions (resulting in fugitive dust) and combustion sources. Combustion of fossil fuels is the primary source of directly emitted PM2.5, and combustion exhaust contains nitrogen and sulfur compounds that react to form PM2.5 in the atmosphere. In San Francisco, the 24-hour average concentrations of PM2.5 have exceeded the standards in recent years, as shown in Table 5.3-3.

Toxic Air Contaminants. Toxic air contaminants (TACs) are air pollutants that may lead to serious illness or increased mortality, even when present in relatively low concentrations. Potential human health effects of TACs include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another's. TACs do not have ambient air quality standards, but are regulated by the local air districts using a risk-based approach. The Air Toxics "Hot Spots" Information and Assessment Act (Assembly Bill [AB] 2588) was enacted in September 1987. The project would not be considered a stationary source subject to AB 2588 requirements.

The BAAQMD uses a health risk assessment to determine what stationary sources to control as well as the degree of control. If the BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or stationary modified source would pose a potential public health risk, then the applicant would be subject to a health risk assessment for the source in question. Such an assessment also evaluates the chronic and acute hazards and the potential increased cancer risk stemming from exposure to a change in airborne TACs. The BAAQMD has found as part of its 2010 Clean Air Plan that the estimated lifetime cancer risk (70-year lifespan) from regional exposure to all air toxics combined declined from 1,330 cases per million in 1990 to 405 cases per million people in 2008 (BAAQMD, 2010b). Diesel particulate matter (DPM) is classified as a TAC, and statewide and local programs focus on managing this pollutant because many toxic compounds adhere to diesel exhaust particles.

Sensitive Receptors. Residential areas, day care centers, hospitals, and schools are some examples of sensitive receptors. The BAAQMD defines sensitive receptors as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses (BAAQMD, 2012).

Rules and Regulations

Federal Clean Air Act (CAA). The CAA originally established the NAAQS in 1970 for the criteria air pollutants considered to be the most prevalent and known to be hazardous to human health. The Federal CAA requires states exceeding the standards to prepare air quality plans showing how the standards will be met. The Federal CAA Amendments of 1990 expanded the role of the USEPA to set nationwide emissions standards for sources toxic air contaminants and specific categories of sources.

California Clean Air Act. The California CAA requires each region to develop and implement strategies to attain CAAQS and establishes broad authority for California to regulate emissions from mobile sources. Local air districts, including the BAAQMD, must periodically prepare air quality management plans showing how the standards will be met.

USEPA/CARB Off-Road Mobile Sources Emission Reduction Program. The California Clean Air Act mandates that CARB achieve the maximum degree of emission reductions from all off-road mobile sources in order to attain the state ambient air quality standards. Off-road mobile sources include construction equipment, marine vessels, and harbor craft. Tier 1, Tier 2, Tier 3, and Tier 4 standards for large compression-ignition engines used in off-road mobile sources began to go into effect in California in 1996, 2001, 2006, and 2008, respectively. In addition, construction equipment can be retrofitted to achieve lower emissions using the CARB-verified retrofit technologies. The engine standards and ongoing separate rule-making for marine vessels and harbor craft jointly address NOx emissions and toxic diesel particulate matter (DPM) throughout the State.

CARB Portable Equipment Registration Program. This program allows owners or operators of portable engines and associated equipment commonly used for construction to register their units under a statewide portable program that allows them to operate their equipment throughout California without having to obtain individual permits from local air districts.

Bay Area Air Quality Management District and Regional Air Quality Management Plans. Responsibility for developing regional air quality management plans lies with the BAAQMD. The local air district also has the authority to issue permits through its rules and regulations by requiring that new stationary sources be subject to New Source Review (NSR) under BAAQMD Regulation II (Permits). The NSR program ensures that the new stationary sources would not interfere with progress to attain the ambient air quality standards. No stationary sources would be associated with the Proposed Project or subject to permitting. Emissions from mobile and portable sources and temporary activities (such as construction) are managed through the state and federal programs that control motor vehicle emissions and set performance standards for diesel engines that power the equipment.

The BAAQMD periodically prepares and updates the regional air quality management plans to show how the district intends to achieve ambient air quality goals. These plans usually include measures to reduce air pollution emissions from industrial, area, mobile and other sources. In 2001, the Ozone Attainment Plan was prepared for the Bay Area as part of the State Implementation Plan to achieve the ozone standards. Later in 2005, the Bay Area Ozone Strategy was prepared to detail how the BAAQMD will achieve the State 1-hour ozone standard. The BAAQMD 2010 Clean Air Plan establishes the programs and schedule for the following integrated goals, to: attain air quality standards; reduce population exposure and protecting public health in the Bay Area; and reduce greenhouse gas emissions and protect the climate (BAAQMD, 2010b).

The BAAQMD's Board of Directors adopted thresholds of significance and CEQA Air Quality Guidelines in June 2010, but as a result of a March 2012 judicial action, the BAAQMD no longer recommends that thresholds in the 2010 guidelines be used as a generally applicable measure of significant impacts.[3] The updated May 2012 BAAQMD CEQA Air Quality Guidelines (BAAQMD, 2012) include recommendations for analysis procedures, and as part of the threshold of significance justifications, the BAAQMD has also prepared detailed documentation to support use of the thresholds of significance (BAAQMD, 2010a).

BAAQMD Proposed 2010 Thresholds of Significance. The BAAQMD developed the following thresholds in advance of adopting guidelines in 2010. Although these thresholds are not a generally applicable measure of significant impacts, this analysis presents the BAAQMD's proposed 2010 thresholds for informational purposes (BAAQMD, 2010a). For criteria air pollutant emissions, a project during construction may cause a significant impact if it would:

- Emit more than 54 pounds per day (lb/day) of reactive organic gases (ROG) or volatile organic compounds (VOC);
- Emit more than 54 lb/day of nitrogen oxides (NOx);
- Emit more than 82 lb/day of PM10 from exhaust; or
- Emit more than 52 lb/day of PM2.5 from exhaust.

Similar thresholds exist for a project during operation along with a threshold for localized concentrations of CO greater than 9.0 ppm (8-hour average) or 20.0 ppm (1-hour average). For PM10 and PM2.5 related to construction fugitive dust, the BAAQMD proposed that projects should include best management practices (BMPs) rather than achieve specific emissions thresholds. The BMPs are construction emissions control measures that appear in the BAAQMD CEQA Guidelines, Updated May 2012 (BAAQMD, 2012; Table 8-1 and Table 8-2).

The BAAQMD's proposed thresholds for community risk and hazards (BAAQMD, 2010a) specify that a project may cause a significant impact if the emissions create:

- Increased incremental cancer risk greater than 10.0 in a million;
- Increased non-cancer hazard greater than 1.0 Hazard Index for chronic or acute hazards;
- Incremental increase of annual average PM2.5 concentration greater than 0.3 $\mu g/m^3$ from a single source.

The BAAQMD CEQA Guidelines, Updated May 2012 (BAAQMD, 2012), notes that construction-related TAC emissions from on-road haul trucks and off-road equipment exhaust emissions are of a variable nature. Construction TAC emissions occur over a temporary timeframe, especially when considering the short amount of time such equipment is typically within an influential distance of sensitive receptors. In addition, current models and methodologies for conducting health risk assessments are associated with generally long-term exposure periods (e.g., 9, 40, or 70 years), which do not correlate well with the temporary and highly variable nature of construction activities. This results in difficulties with producing accurate estimates of construction-phase health risk.

[3] The BAAQMD describes the status of its CEQA Guidelines at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx.

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study (see Table 5.3-4).

Table 5.3-4. Applicant Proposed Measures (APMs) Related to Air Quality

APM Number	Issue Area
	Air Quality
APM AQ-1	**Minimize Fugitive Dust.** Consistent with Table 2 of the [1999] 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.

Table 5.3-4. Applicant Proposed Measures (APMs) Related to Air Quality

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 Airborne Toxic Control Measure (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

5.3.2 Environmental Impacts and Mitigation Measures

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

NO IMPACT. The BAAQMD is the primary agency responsible for managing local air quality and administering other California and federal programs ensuring implementation of the air quality management plan. A project could be inconsistent with the applicable air quality management plan or attainment plan if it could cause population and/or employment growth or growth in vehicle-miles traveled in excess of the growth forecasts included in the air quality attainment plan. The Proposed Project would not create any new permanent full-time or part-time jobs. Local and existing PG&E crews would commute to the project area as needed for operation or maintenance, and contracted crews would be drawn from existing service providers for stand-by marine transportation and technical support for maintenance of the underwater components. Regional air quality plans anticipate some growth, and this anticipated growth includes the addition of some new infrastructure, such as additions to the electric transmission system. Therefore, the Proposed Project would not conflict with or obstruct implementation of the applicable air quality plan. No impact would occur, and no mitigation is required.

b. Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

LESS THAN SIGNIFICANT WITH MITIGATION – CONSTRUCTION. Emissions during the construction phase would include criteria air pollutants that could contribute to existing or projected violations of the ambient air quality standards. The Proposed Project involves construction of a transmission line approximately 3.5 miles in total length, including approximately 2.5 miles to be installed offshore in the San Francisco Bay, 0.4 miles to be installed in horizontal directional drills (HDD) between the transition points on land and the bay, and approximately 0.6 miles to be installed underground in paved areas. Construction equipment that would be used for the Proposed Project is shown in Table 4-4 in Section 4.11.9 (Project

Description). The construction workforce is also described in detail in this section. The number of employees would peak at approximately 75 construction personnel, including switchyard workers, supervisors, and inspectors.

During construction, emissions would be generated along the proposed transmission line route, at the proposed work sites, at the substation and switchyard sites, and along the roadways used to access these locations. Construction emissions would be caused by exhaust from vehicles and equipment (e.g., ozone precursors [volatile organic compounds and NOx], CO, and particulate matter [PM10 and PM2.5]) and fugitive dust/particulate matter from ground-disturbing activities. Diesel and gasoline-powered construction equipment at work sites would include loaders, graders, backhoes, cranes, demolition equipment, and trucks for lifts, delivery, concrete, water, and work crews. Outside of work sites, exhaust emissions would be caused by vehicles transporting equipment and supplies to the sites, trucks removing debris, and workers commuting to and from work sites.

Emission calculation spreadsheets (see Appendix A) describe the methodology for the emission estimates, which rely on factors from the CARB EMFAC2011 model and the California Emissions Estimator Model (CalEEMod), and other resources. Emissions for each phase and for each month of proposed activity are summarized in Appendix A as part of the detailed emission calculations based on the proposed quantities and types of equipment (PG&E, 2013).

Table 5.3-5 shows the results of the estimated average daily construction emissions using equipment that meets USEPA/CARB Tier 2 off-road and marine engine standards. Table 5.3-6 summarizes estimated maximum daily emissions for each year of proposed construction.

Table 5.3-5. Estimated Average Daily Construction Emissions including Mitigation for Tier 2 Equipment (lb/day)

Construction Duration Emissions	NOx	VOC	PM10 (exhaust)	PM2.5 (exhaust)	CO	SOx
Average Daily Emissions	31.69	13.67	9.68	3.37	19.71	1.36
Significance Threshold	**54**	**54**	**82**	**54**	**None**	**None**

Source: See Appendix A for detailed calculations (PG&E, 2013).

Table 5.3-6. Estimated Maximum Daily Construction Emissions including Mitigation for Tier 2 Equipment (lb/day)

Emissions by Year	NOx	VOC	PM10	PM2.5	CO	SO_x
Maximum Daily Emissions 2014	118.24	28.57	75.60	19.18	67.04	0.86
Maximum Daily Emissions 2015	1,329.46	272.33	74.50	49.99	946.40	99.22

Source: See Appendix A for detailed calculations (PG&E, 2013).

Fugitive dust impacts would be avoided by implementing the APMs in Table 5.3-4. Instead of specific, quantified significance thresholds for fugitive dust, the BAAQMD guidelines include recommended measures for dust control. The BMPs in the BAAQMD CEQA Guidelines are incorporated into APM AQ-1 (Minimize Fugitive Dust), APM AQ-2 (Minimize Construction Exhaust Emissions), and APM AQ-3 (Minimize Potential Naturally Occurring Asbestos Emissions). With the implementation of these APMs, the project would comply with all of the BAAQMD's recommended BMPs for fugitive dust, and the impact of fugitive dust during construction would be less than significant.

Table 5.3-5 shows that by using equipment that meets Tier 2 off-road and marine engine standards, construction would not result in average daily emissions exceeding the significance thresholds. Reducing equipment exhaust emissions would occur through APM AQ-2, which incorporates BAAQMD recommendations to minimize emissions. This APM limits idling, requires use of low-emissions vehicles, encourages carpooling, minimizes welding and cutting, and promotes the use of alternative fueled vehicles. However, APM AQ-2 does not clearly specify the achievable level of emissions controls for potential construction equipment. Mitigation Measure A-1 (Achieve minimum emission standards) would be necessary to achieve the emission levels stated in Table 5.3-5. Mitigation Measure A-1 would supplement APM AQ-2 by requiring proper maintenance and tuning of construction equipment and by specifying emissions performance standards that are feasibly achievable and consistent with the emission calculations that appear PG&E's application, shown in Appendix A (PG&E, 2013).

With the implementation of the APMs for air quality and Mitigation Measure A-1, emissions from the Proposed Project would not exceed the significance thresholds, and the project would comply with the dust control measures recommended by BAAQMD. With mitigation, construction-related emissions would not substantially contribute to any air quality violation, and this impact would be less than significant.

Mitigation Measures for Construction-Phase Air Quality

MM A-1 **Achieve minimum emission standards.** This measure incorporates and supplements portions of APM AQ-2, Minimize Construction Exhaust Emissions. PG&E shall maintain all construction equipment properly in accordance with manufacturer's specifications, and ensure that equipment is checked by a certified visible emissions evaluator. All off-road construction diesel engines not registered under the CARB Statewide Portable Equipment Registration Program shall meet at a minimum the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations (CCR) Title 13, Chapter 9, Sec. 2423(b)(1). All marine commercial harbor craft, except gasoline-powered small craft, shall meet at a minimum the Tier 2 Marine Engine Emission Standards (CCR Title 17, Sec. 93118.5).

LESS THAN SIGNIFICANT – OPERATION AND MAINTENANCE. Monitoring and control functions for the new facilities would be connected to the existing PG&E computer system by telecommunications. PG&E's existing local maintenance and operations group would assume monitoring and control duties and maintenance, inspection, and security roles, as needed, with support from a marine contractor. Aside from contracted stand-by marine transportation and technical support, no additional staff would be hired by PG&E after the transmission project is energized and placed into service. Operation of the project would not result in an incremental increase in O&M emissions and would not conflict with air quality plans or violate an air quality standard. Therefore, the air quality impact from the operational phase of the project would be less than significant.

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 WITH MITIGATION – CONSTRUCTION. As noted in Table 5.3-2 (Attainment Status for BAAQMD), the region is currently designated as "nonattainment" for ozone, PM10, and PM2.5. Concurrent construction of other projects in close proximity to the Proposed Project would result in increased local air quality impacts for the duration of simultaneous construction activities. The list of cumulative projects and a detailed cumulative impact assessment appear in Section 5.19.1 and Section 5.19.2, respectively. Emissions generated by construction of the Proposed Project would be temporary and variable and would be similar in nature to emissions from other typical and nearby construction activities. Simultaneous construction of City projects and other cumulative projects in close proximity to the project work sites would generally be subject to the San Francisco Dust Control Ordinance and would be likely to implement general BAAQMD recommendations for minimizing air quality impacts. All activities must comply with BAAQMD rules regarding dust control. Table 5.3-5 shows that construction-related criteria air pollutants would not exceed thresholds that indicate cumulatively considerable levels. Therefore, with the implementation of APMs AQ-1 through AQ-3 and Mitigation Measure A-1 (Achieve minimum emission standards), construction of the project would not result in a cumulatively considerable net increase of any criteria pollutants for which the project region in is nonattainment, and the construction impacts with mitigation would be less than significant under this criterion.

LESS THAN SIGNIFICANT – OPERATION AND MAINTENANCE. Item (b) above notes that operational emissions would result from limited vehicle use related to periodic maintenance, repair, and inspection of the project components, and that the emission levels would be below the BAAQMD thresholds. This would not result in a cumulatively considerable net increase of any criteria pollutant, and impacts would be less than significant.

d. Would the project expose sensitive receptors to substantial pollutant concentrations?

LESS THAN SIGNIFICANT WITH MITIGATION. Construction would generate toxic air contaminants routinely found in the exhaust of gasoline powered motor vehicles and of diesel-fueled equipment, including diesel particulate matter (DPM). Residences, the Bright Horizons/Marin Day School day care center at Hills Plaza, and other sensitive receptors near the anticipated work areas would be temporarily exposed to increased concentrations of DPM and other toxic air pollutants from the construction-related mobile sources. Maps of surrounding land uses are in Section 5.10, Land Use (see Figure 5.10-1 and Figure 5.10-2).

Construction-phase emission rates for all portions of the underground, submarine, and switchyard construction are summarized in Table 5.3-5, and the pollutants include diesel particulate matter (DPM), shown as PM2.5 exhaust and VOC, which includes other air toxics common to diesel use. Emissions of DPM would occur at an average rate of 3.5 lb/day, from sources spread along the total transmission line route of 3.5 miles; this would include sources operating in the open water far from sensitive receptors. Appendix A includes detailed emission calculations and the quantities and types of equipment.

Sensitive receptors occur along the northern portion of the proposed underground construction route. High-density residential development and day care use occur along Spear and Folsom Streets and near the HDD area where the northern portions of project construction would occur. The Bright Horizons/Marin Day School day care center at Hills Plaza has an outdoor play area for children adjacent to the sidewalk on Spear Street, and could be within about 25 feet of underground construction activity. Street-level residential lofts and townhomes at 400 Spear Street would also be within 25 feet of underground construction activity and the northern HDD transition work area. The other residential uses in the northern onshore section are typically apartment or condominium towers, often with commercial use at street level. This places most residences above the street, at higher elevations where lower levels of pollutants typically occur. No schools or hospitals are located within 1,000 feet of the existing Potrero Switchyard.

Excavation of trenches and other underground utility construction would potentially expose sensitive receptors to construction-related emissions, including emissions of DPM and other toxic air contaminants, which would expose the receptors to increased health risk and hazards. Activities along the northern portion of the route through Rincon Hill would be most intense at the Embarcadero Substation and at the HDD area on Spear Street, where 24-hour work could occur. Underground transmission line work would occur over approximately 8 months during daytime hours, and construction at any one work site would last a much shorter time, as construction would progress at approximately 150-300 feet per day. The construction-related emissions would be sporadic as the different phases of construction would pass near receptors during the short-term. The linear nature of the work ensures that sensitive receptors near the HDD transition area would experience increased pollutant concentrations for a few months. Other residences and the day care facility along the route would experience much shorter durations of increased pollutant concentrations, up to about 9 days for each phase, as the various phases pass each location (Section 4.11.8, Construction Phasing).

PG&E would implement APM AQ-1 for fugitive dust control and APM AQ-2 to control the emissions from construction equipment fleet by using low-emissions technologies, such as newer engines, retrofit engines, add-on devices including particulate filters, or use of electric grid power instead of diesel fuel where feasible. Emissions of naturally occurring asbestos would be controlled by implementing APM AQ-3. These measures would reduce the potential for exposure to substantial pollutant concentrations during construction. Because of the proximity of sensitive receptors to the construction sites, and because of the need to clearly specify the achievable level of emissions controls, additional mitigation (Mitigation Measure A-1 to achieve minimum emission standards) is recommended to supplement APM AQ-2 and achieve feasible levels of control of diesel exhaust, which would ensure that receptors would not be exposed to substantial concentrations of DPM or other toxic air contaminants. These measures would reduce the construction phase impacts to a less than significant level. During project operations, emissions would result from limited use of vehicles for routine maintenance, repair, and inspection that would not expose sensitive receptors to substantial concentrations of air pollutants. Impacts under this criterion would be less than significant.

e. Would the project create objectionable odors affecting a substantial number of people?

LESS THAN SIGNIFICANT. The project would not include any sources likely to create objectionable odors. Project construction would involve the temporary use of vehicles and construction equipment and materials, such as drilling fluids, that may generate intermittent, minor odors. Emissions of this nature would occur briefly during construction and would cease as the construction activity would move through phases and between work areas. There would be no notable impact of objectionable odors affecting a substantial number of people. Impacts would be less than significant.

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5.4 Biological Resources

BIOLOGICAL RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	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 Wildlife 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?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

5.4.1 Setting

Section 5.4.1 describes the existing biological resources, including plants and wildlife, habitats, and special-status species, in the vicinity of the Proposed Project. Section 5.4.2 addresses potential impacts to biological resources and, where necessary, specifies mitigation measures to reduce potential impacts to less-than-significant levels.

The Proposed Project would be located on the eastern edge of San Francisco and in the San Francisco Bay. The route of the proposed transmission line would be partially submarine and would pass through the waterfront, shoreline, and open-water areas of Central San Francisco Bay from Piers 28 and 30/32, south of the San Francisco-Oakland Bay Bridge, to 23rd Street. The Central Bay is typically colder and more saline than other regions of the San Francisco Bay. For the purposes of this analysis, the "Proposed Project area, the "project area," or the "project route" refers to the footprint that would be directly affected by the project and the immediate vicinity of the project footprint.

This analysis of biological resources for the Proposed Project is based on:

- Review of the Proponent's Environmental Assessment (PG&E, 2012), including results from field reconnaissance surveys conducted by Garcia and Associates (GANDA) on May 21, 2012, and by CH2M Hill biologists on June 22, 2012;
- Review of California Department of Fish and Wildlife (CDFW, formerly California Department of Fish and Game) California Natural Diversity Database (CNDDB) for 5 miles surrounding the project route (CNDDB, 2011);

- Review of California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants for 5 miles surrounding the project route (CNPS, 2011);
- Review of U.S. Fish and Wildlife Service (USFWS) critical habitat portal (USFWS, 2011); and
- Review of environmental impact reports (EIRs) and permits for similar projects located near the project area: Trans Bay Cable EIR (City of Pittsburg, 2006a and 2006b) and the America's Cup EIR (SF Planning Department, 2011).

Habitat

Terrestrial Habitat. Onshore portions of the project footprint would be in city streets or disturbed areas of the waterfront. Biological resources in these areas are limited to street trees and some disturbed ruderal habitat. The proposed northern cable landing location would be between Piers 28 and 30/32; the surrounding area is entirely paved. At this northern location, HDD would pass under the seawall, terminating at the cul-de-sac on Spear Street. There are over 110 trees planted along the sidewalks that line the northern project route on The Embarcadero, Spear Street, and Folsom Street near the Embarcadero Substation. Approximately one third of these are large, mature trees that may provide nesting habitat for many species of urban birds and possibly also roosting habitat for bats. The trees along the northern portion of the project route include palm trees (*Arecaceae sp.*), sycamores (*Platanus sp.*), bottlebrush (*Callistemon sp.*), sweetgum (*Liquidambar styraciflua* 'Rotundiloba') and a variety of other ornamental street tree species. Table 5.4-1 shows a breakdown of trees along this portion of the project route.

Table 5.4-1. Street Trees along Northern Project Route

Location	Total Trees	Very Large/ Mature Trees
The Embarcadero	3	3
Spear St (Embarcadero to Harrison St)	25	13
Spear St (Harrison St to Folsom St)	50	11
Folsom St (Spear St to Main St)	16	7
Folsom St (Main St to Beale St)	9	2
Folsom St (Beale St to Zeno Pl)	6	6
Folsom St (Fremont St to First St)	3	3
Totals	**112**	**45**

Depending on the precise location of the underground line (determined during final design), some of these trees may need to be removed or trimmed. One entire row of 18 sweetgum trees (2 to 3 inches in diameter and 10 to 15 feet tall) on Spear Street between Folsom Street and Harrison Street could potentially be trimmed or removed during construction (PG&E, 2013). These trees are part of a linear park that was created in 2009 (Buffalo Rising, 2009); these trees are not as large and mature as other trees in the project area and are not likely to support nesting birds.

At the proposed southern cable landing location, horizontal directional drilling would pass under the shoreline, and pipe for the HDPE conduit would be dragged from the street to float on the water across the shoreline, which is covered in riprap. Vegetation in this area is largely limited to ornamental shrubs and trees around Potrero Switchyard. There is no tree trimming or removal planned in this portion of the project area. There are no wetlands along the project route. The nearest known wetland is near Pier 96, about 0.5 miles south of Potrero Switchyard (San Francisco Planning Department, 2011). The two proposed cable landing locations and the surrounding areas are highly urbanized and largely paved.

Marine Habitat. The submarine portions of the project route would pass through natural and artificial intertidal, subtidal, and open-water habitats. Marine habitats and associated marine communities in the project 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; CCC, 2010). The bay depth in the project area is about 10 feet along the east-west portion near the former Potrero

Power Plant. The depth ranges from approximately 30 feet deep along the southern portion to 70 feet deep along the northern portion of the proposed submarine route (see also Section 5.9, Hydrology and Water Quality). Ambient underwater noise levels in the project area are heavily influenced by the anthropogenic activity in the bay, such as marine vessels or construction that occurs in the water (see Noise, Section 5.12 for an explanation of the marine acoustic setting).

- **Intertidal Habitat**. Intertidal habitat is habitat between the low and high tide lines. The project would include drilling through sediment beneath the bay shoreline and adjacent intertidal habitat, 40 to 50 feet below the water surface. Intertidal habitat located along the project route 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. There are no natural rocky areas, sandy beaches, or wetlands on the shore along the proposed route.
- **Subtidal Habitat**. Subtidal habitat consists of the submerged area below the low tide mark. Within the San Francisco Bay, these habitats include mud, shell, sand, rocks, artificial structures, shellfish beds, eelgrass beds, algal beds, and the water column above the bay bottom (CCC, 2010). Subtidal habitat along the proposed route consists of soft-bottom mud and sandy habitats and the water column above them. There are no eelgrass (*Zostera marina*) beds, shell, or rock are along the route, nor are there any planned eelgrass or shell bed restoration projects in the area (Subtidal Habitat Goals Project [SHGP], CCC, 2012). The project route passes through subtidal open-water and bottom-sediment habitat (PG&E, 2012). Figure 5.4-1 shows subtidal habitat in the Proposed Project area.

Special-Status Plants and Animals

For the purposes of this analysis, special-status species are species that are:

- Listed as Endangered, Threatened, Candidate or Proposed by U.S. Fish and Wildlife Service (USFWS);
- Protected under the federal Marine Mammal Protection Act (MMPA);
- Regulated Fishery under Sections 8550-8559 of California Fish and Game Code;
- Listed as Endangered, Threatened, Rare, or Candidate by California Department of Fish and Wildlife (CDFW, formerly California Department of Fish and Game);
- Fully Protected under California Fish and Game Code;
- California Species of Special Concern;
- California Rare Plant Rank (CRPR)[1] 1A, 1B, 2, 3, or 4 by CDFW/California Native Plant Society;
- State regulated fishery (under California Code of Regulations Title 14. Natural Resources); or
- Otherwise meets the definition of rare, threatened, or endangered as described in the CEQA Guidelines, Section 15380.

CNDDB records identify 49 special-status terrestrial species within 5 miles of the Proposed Project footprint. These species are shown in Appendix B. Based on reconnaissance surveys and literature review, the project area does not have suitable habitat for any of these species (PG&E, 2012). The full species list from the Proponent's Environmental Assessment is shown in Appendix B.

There are least 16 federally managed fish species (Magnuson-Stevens Act, see Applicable Regulations) that may be present in the project area (SF Planning Department, 2011). These managed fish species are shown in Table 5.4-2.

[1] CDFW has changed references to CNPS List to California Rare Plant Rank (CRPR) to clarify that CDFW plays an active and authoritative role in the ranking process. See September 2010 CNDDB newsletter: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/CNDDB_News_Sep_2010.pdf.

Table 5.4-2. Managed Fish Species (Magnuson-Stevens Act) in the Project Area

- Northern anchovy *(Engraulis mordax)*[2]
- 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 elongatus)*
- 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)*

There are no special-status marine invertebrates in the San Francisco Bay; however, there are 11 special-status marine species (fish and mammals) with high or moderate potential to be present in the project area:

- Green sturgeon (*Acipenser medirostris,* Federally Threatened/State Species of Special Concern)
- Central California Coast coho salmon (*Oncorhynchus kisutch*, Federally Endangered/State Endangered)
- Chinook salmon (*Oncorhynchus tshawytscha*, Winter-Run Federally Endangered/Spring-Run Federally Threatened)
- California central coast steelhead (*Oncorhynchus mykiss irideus,* Federally Threatened)
- Longfin smelt (*Spirinchus thaleichthys,* State Threatened/Federal Candidate for Listing)
- Pacific herring (*Clupea pallasii,* State Regulated Fishery)
- Great white shark (*Carcharodon carcharias*, Candidate for State Listing)
- Pacific harbor seal (*Phoca vitulina richardsi,* Federal Marine Mammal Protection Act [MMPA])
- California sea lion (*Zalophus californianus,* MMPA)
- Harbor porpoise (*Phocoena phocoena*, MMPA)
- Gray whale (*Eschrichtius robustus*, MMPA)

The San Francisco Bay is federally designated as critical habitat for the southern Distinct Population Segment (DPS) of North American green sturgeon and for the DPS of Central California Coast steelhead.

North American Green Sturgeon (Federally Threatened, State Species of Special Concern). Green sturgeon is an anadromous[3] fish found in 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. Adults spawn in cool sections of the Sacramento River from March through July, with peak spawning 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 rivers (Moyle et al., 1995). Juvenile and subadult green sturgeon use the San Francisco Bay as rearing and migration habitat, and the entire marine portion of the project route is within designated critical habitat for foraging and rearing. However, there is no known spawning habitat for North American green sturgeon within San Francisco Bay, and the project is outside its the major migratory corridor. Green sturgeon's known benthic prey resources are much more plentiful on the broad subtidal areas farther south and also upstream in San Pablo Bay and up into the Delta (Kolhorst, 2001).

2 Northern anchovy (*Engraulis mordax*) is the dominant fish species in the Central Bay (accounting for up to 94 percent of fish the water column). Pacific herring (*Clupea pallasii*) and jacksmelt (*Atherinopsis californiensis*) are the second and third most common fish. (SF Planning Department, 2011)

3 An anadromous fish, born in fresh water, spends most of its life in the sea and returns to fresh water to spawn (NOAA, 2011). http://www.nefsc.noaa.gov/faq/fishfaq1a.html

Source: PG&E, 2012.

Figure 5.4-1
Subtidal Habitat

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Central California Coast Coho Salmon (Federally Endangered, State Endangered). The National Marine Fisheries Service (NMFS) has listed several Coho salmon populations as threatened or endangered Evolutionarily Significant Units (ESUs), based on the river systems where they spawn. The Central California ESU includes all naturally spawned populations from Punta Gorda in northern California south to the San Lorenzo River in central California, as well as populations spawning in tributaries to San Francisco Bay, excluding the Sacramento–San Joaquin River system. Juvenile Coho may be present in the San Francisco Bay in the fall, winter, and spring (San Francisco Planning Department, 2011). There is suitable foraging habitat for Coho along the proposed submarine route; however, no known or potential spawning streams exist in the vicinity of the Proposed Project (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 or potential spawning streams in the vicinity of the Proposed Project (CNDDB, 2012). Critical habitat for the spring-run Chinook is located north of the Bay Bridge. Adults are found in San Francisco Bay during the migratory period in the spring, and there may be juveniles in the bay in the fall, winter, and spring. There may be low numbers of spring-run Chinook in the Central Bay and in the vicinity of the Proposed Project (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 (San Francisco Planning Department, 2011). The project area is outside the migratory corridor for these runs.

Central California Coast Steelhead Trout (Federally Threatened). The Central California Coast steelhead trout DPS distribution spans the California coast from the Russian River south to Aptos Creek in Santa Cruz County. Generally, coastal California steelhead live in fresh water for two years, then spend one or two 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[4] generally rear in edgewater habitats. 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). The entire San Francisco Bay, including the proposed submarine cable route, is designated as critical habitat for Central California Coast steelhead along the. Central California Coast steelhead trout are rare in most tributaries to the San Francisco Bay (San Francisco Planning Department, 2011). Suitable foraging habitat exists along the proposed submarine route, but there are no known or potential spawning streams in the vicinity of the Proposed Project.

Longfin Smelt (State Threatened and Candidate for Federal Listing). 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. USFWS considers the San Francisco Bay-Delta population distinct from other populations along the west coast (USFWS, 2012). Longfin smelt are anadromous and tolerate a wide range of salinities. They typically have a two-year lifecycle. Longfin smelt spawn in the middle Delta in winter and disperse throughout the San Francisco Bay estuary as they mature. In the early spring and early 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 present in the Central Bay, including the waters adjacent to the Port of San Francisco (San Francisco Planning Department, 2011). There is no spawning habitat for

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[4] Fry is the stage in the salmonid life history when the juvenile has absorbed its yolk sac and leaves the nest to swim up into the water column.

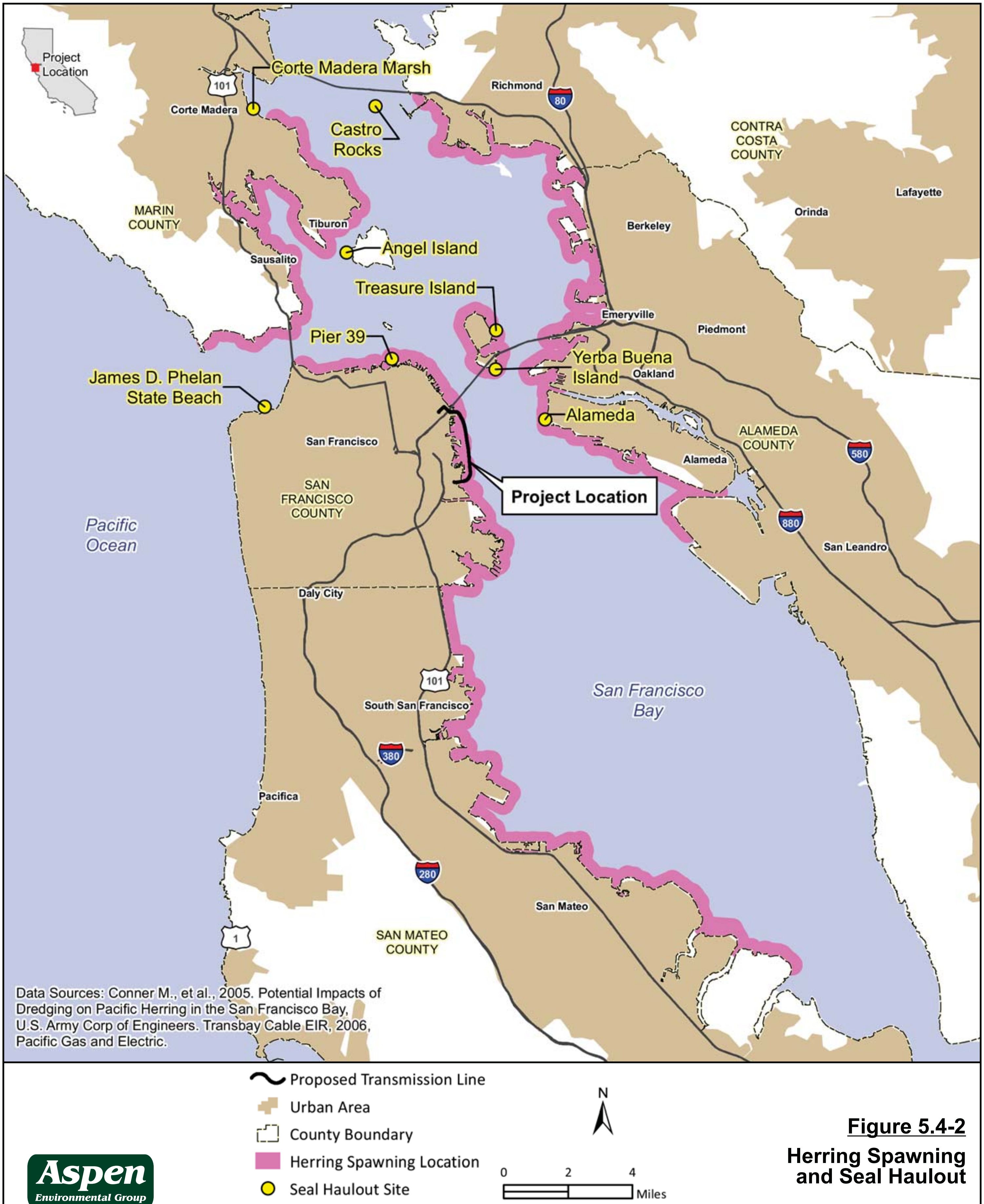
longfin smelt near the project area (USFWS, 2012). However, there is suitable foraging habitat along the proposed submarine route (USFWS, 2012). Longfin smelt are typically found in the middle to lower water column except at night when they move to surface waters. Longfin smelt abundance is tightly correlated with the amount of freshwater outflow from the delta, and in years of low outflow the abundance of longfin smelt is expected to decrease (Stevens and Miller, 1983). In years with higher levels of outflow, longfin smelt generally have a higher distribution throughout the bay and higher overall abundance (Rosenfield and Baxter, 2007). Longfin smelt feed on plankton. Their population in San Francisco Bay is thought to have declined due to water management practices and excess nutrients (reduced fresh water flow and discharge from wastewater treatment plants) and due to introduced non-native species (especially the overbite clam) that also eat plankton (USFWS, 2013).

Pacific Herring. The San Francisco Bay Pacific herring is regulated as a commercial state fishery under Sections 8550-8559 of the California Fish and Game Code (CFGC) (Bartling, 2006). It is also a key part of the San Francisco Bay marine ecosystem; it provides an important food source for marine mammals, sea birds, and fish. Pacific herring spawning areas have relatively low salinity, calm and protected waters, and marine vegetation or intertidal areas. The largest spawning groups 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 before moving into shallow areas to spawn. The proposed submarine cable route is located in a calm and protected area with reduced salinity. The entire proposed submarine project area is considered spawning habitat for Pacific herring (Bartling, 2006; City of Pittsburg, 2006). Figure 5.4-2 shows the spawning areas for Pacific herring in the San Francisco Bay.

Great White Shark (Candidate for State Listing). The northeastern Pacific population of great white shark is a Candidate for state and federal listing. This species is also protected from commercial or recreational fishing by California Fish and Game Code Section 2806. Great white sharks are found in coastal surface waters around the world, including in the coastal Pacific Ocean. Small numbers of great white sharks have been observed in the San Francisco Bay near the Golden Gate Bridge (Jorgensen et al., 2009). There is some (low) potential for great white shark in the project area, but it is not a mating or pupping area for the species.

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. It is the only marine mammal species that is a permanent resident in the San Francisco Bay (NMFS, 2012a). Figure 5.4-2 shows known Pacific harbor seal haul-out locations near the Proposed Project; the closest haul-out site is located on Yerba Buena Island approximately 2 miles to the northeast. This haul-out site is most frequently used during the winter months (Bohorquez, 2002). Harbor seals typically forage on a variety of fish in the deepest waters of the bay and are expected to move through the project route.

California Sea Lion (Federal Protection under Marine Mammal Protection Act). California sea lions are not listed under the federal ESA, considered depleted under the MMPA, or considered a strategic stock under the MMPA (NMFS, 2007c). California sea lions do not use San Francisco Bay for breeding or pupping (NMFS, 2007c); however, they forage in and pass through the project area. Sea lions often use structures such as boat docks and navigational buoys as haul-out areas. Figure 5.4-2 shows known California sea lion haul-out locations near the Proposed Project area; the closest haul-out site is on Yerba Buena Island (2 miles to the northeast). Sea lion numbers typically fluctuate according to the abundance of herring in the area (San Francisco Planning Department, 2011).



Aspen Environmental Group

Source: PG&E, 2012.

Figure 5.4-2
Herring Spawning and Seal Haulout

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Harbor Porpoise (Federal Protection under Marine Mammal Protection Act). Harbor porpoise are commonly observed in bays, estuaries, and harbors less than 650 feet deep (similar to the San Francisco Bay/ Delta). The California stock of harbor porpoise is not considered strategic by NMFS (NMFS, 2012a). Harbor porpoises have recently been seen foraging near the Golden Gate Bridge and areas of the Central Bay (American Cetacean Society, 2012). The primary food sources for harbor porpoise are fish and squid. There have been no known sightings 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 (Caltrans, 2006). Harbor porpoises may occur occasionally in the project area.

Gray Whale (Federal Protection under Marine Mammal Protection Act, Eastern North Pacific DPS delisted in 1994 due to population status “recovered”). Gray whales occasionally stray into San Francisco Bay during their normal migrations north and south along the coast. Most reports have been in the Central Bay north of the Bay Bridge and in the North Bay. Grey whales have been reported as far south in the bay as Coyote Point (Oliver et al., 2012). They are not expected to occur regularly in the project area.

Western Red Bat. In addition to the marine species discussed above, western red bat (California Species of Special Concern) have been found in San Francisco. However, the nearest known occurrence to the project area is in Golden Gate Park, approximately 4.5 miles away and separated from the trees along the project route by an densely developed urban area (CNDDB, 2012). Western red bat is usually found in riparian corridors greater than 160 feet wide dominated by sycamore, valley oak, and cottonwood trees (CDFW, 2004; CDFW, 1988-1990). Therefore, western red bat is unlikely to occur in the project area.

Applicable Regulations

Federal

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 (NOAA) National Marine Fisheries Service (NMFS, also known as NOAA Fisheries). The federal 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).

The U.S. Army Corps of Engineers (USACE), as the federal action agency conducting the dredging permit review, would be subject to demonstrating project compliance with the federal ESA. Under Section 7 of the federal 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 their critical habitat. The USFWS or NMFS determines whether 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 or NMFS 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.

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, which extend to 200 miles offshore. The Act is intended to facilitate conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities. Sections 305(b)(2) to (4) of the Magnuson-Stevens Act outline 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 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. 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; and (4) "Spawning, breeding, feeding, or growth to maturity" covers a species' full lifecycle.

Marine Mammal Protection Act (16 U.S.C. § 1371). Under the Marine Mammal Protection Act (MMPA) of 1972 (as amended in 2007), it is unlawful to take or import marine mammals and marine mammal products. The MMPA defines "take" as to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." (16 U.S.C. §1362(13).) The MMPA defines harassment as "any act of pursuit, torment or annoyance which has the potential to either: (i) injure a marine mammal or marine mammal stock in the wild, or (ii) disturb a marine mammal or marine mammal stock by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering." Levels of harassment are further defined: "Level A harassment" means harassment which has the potential to injure, and "Level B harassment" means harassment which has the potential to disturb, a marine mammal or marine mammal stock in the wild. (16 U.S.C. §1362(18).) 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 one year and that will have a negligible impact on the impacted species. If the potential for serious injury and/or mortalities exists, and there are no measures that could be taken to prevent this form of "take" from occurring, a Letter of Authorization (LOA) must be obtained. NMFS reviews reports for "strategic stocks" of marine mammals annually. A strategic stock is a marine mammal stock: "for which the level of direct human-caused mortality exceeds the potential biological removal level; which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the federal ESA within the foreseeable future; or which is listed as threatened or endangered under the federal ESA, or is designated as depleted under the MMPA."

National Oceanic and Atmospheric Administration (NOAA) Fisheries/National Marine Fisheries Service (NMFS) Marine Mammal Acoustic Guidelines. High levels of received underwater sound pressure levels can cause harassment and injury of marine mammals. Marine mammals are considered particularly susceptible to injury and behavioral impacts from anthropogenic noise. (Section 5.12, Noise, provides more information on underwater noise sources.) NOAA Fisheries/NMFS is currently developing species-specific guidelines that would set thresholds for noise impacts on marine mammals (NMFS, 2013a). Until new guidelines are provided, there are two statutory levels of harassment for marine mammals. NMFS currently provides Interim Sound Threshold Guidance (NMFS, 2013b), which NMFS uses in its MMPA permitting processes. NMFS has applied these thresholds of received sound pressure levels in MMPA permits and ESA Section 7 consultations for marine mammals as conservative indicators of whether harassment may occur. Level A harassment may cause physical injury, and Level B harassment may cause behavioral disruption.

- The Level A harassment threshold is 180 decibels referenced to 1 micropascal (180 dB re 1 µPa) for cetaceans (harbor porpoises and gray whale) and 190 dB for pinnipeds (Pacific harbor seals and California sea lions).
- The Level B harassment threshold is 160 dB for pulsed noise and 120 dB for continuous noise (NMFS, 2013b).

Migratory Bird Treaty Act (16 U.S.C. §§ 703–711). The Migratory Bird Treaty Act (MBTA) of 1918 protects all migratory birds. 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 (CWA). The purpose of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Clean Water Act Section 404 and the Rivers and Harbors Act of 1899 Section 10 define waters of the United States and wetlands. 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). Section 404 of the CWA prohibits fill of and dredging of Waters of the U.S. without prior authorization from the USACE.

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). 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 San Francisco Bay Regional Water Quality Control Board (RWQCB) and is discussed further in Section 3.9, Hydrology and Water Quality. The RWQCB has conditionally pre-certified certain actions under Nationwide Permits (NWP) that may be obtained in lieu of an individual permit.

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 USACE has the authority to regulate the navigable capacity of any of the waters of the United States.

Dredged Material Management Office. Dredge is defined as material excavated in waters. The Dredged Material Management Office (DMMO) is a joint program of the USACE, San Francisco Bay Conservation and Development Commission (BCDC), RWQCB, California State Lands Commission, and USEPA. CDFW, USFWS, and NMFS provide advice and expertise. 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. This interagency group is intended to increase efficiency and coordination between the member agencies and to foster a comprehensive approach to handling dredged material management issues. The DMMO has established seasonal work windows when dredging and in-water construction are allowed because listed fish species are unlikely to be present at these times. The USACE typically requires work to be done within these work windows as a condition of the dredging permit.

State

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 CDFW. The state definition of "take" is to hunt, pursue, catch, capture, or kill a member of a listed species or attempt to do so. CDFW 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 CDFW 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). "Take" permits for fully protected species may only be issued for fully protected species that are "covered" species in a Natural Community Conservation Plan (NCCP). 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.

CFGC 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 3503.5 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. Section 3513 makes it unlawful to take or possess any migratory non-game birds designated under the MBTA, except as provided by rules and regulations adopted under the MBTA.

California Species of Special Concern. "Species of Special Concern" is a designation assigned by the CDFW to species it considers at risk. Species of Special Concern meet one or more of the following criteria: (1) is extirpated from the State or, in the case of birds, in its primary seasonal or breeding role; (2) is federally, but not State, listed as threatened or endangered; meets the State definition of threatened or endangered but has not formally been listed; (3) is experiencing, or formerly experienced, serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status; (4) has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for State threatened or endangered status. "Species of Special Concern" is an administrative designation intended to focus attention on at-risk species during environmental review and conservation planning. Species of Special Concern 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. Because Section 15380 of the CEQA Guidelines defines endangered, rare or threatened species to include species which meet criteria consistent with the criteria required for listing under the federal and/or state endangered species acts regardless of whether such species are formally listed, Species of Special Concern are appropriately considered in the analysis of project impacts.

McAteer-Petris Act of 1965 (CGC §§ 66650-66661). The McAteer-Petris Act created the San Francisco Bay Conservation and Development Commission (BCDC), which is a state agency with permit authority over the bay and its shoreline. 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. 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."

California Marine Invasive Species Program. The California State Lands Commission's Marine Invasive Species Program is intended to prevent the release of nonindigenous species from commercial vessels into California waters. The program began in 1999 with the passage of California's Ballast Water Management for Control of Nonindigenous Species Act. In 2003, the Marine Invasive Species Act (MISA) was passed, reauthorizing and expanding the 1999 Act. Subsequent amendments to MISA and additional legislation has further expanded the scope of the program to include research, management and policy development related to vessel fouling and ballast water treatment technologies.

Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the Proposed 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 operate under a General Plan that was adopted in June 1996 and amended 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.

San Francisco's Urban Forestry Ordinance (Article 16 of the San Francisco Public Works Code). Street trees are "any tree growing within the public right-of-way, including unimproved public streets and sidewalks, and any tree growing on land under the jurisdiction of the Department [of Public Works]" as defined in Section 802 of the Ordinance. The removal of street trees by persons other than the Department of Public Works is restricted by Section 806b, whereby a permit is required for removal. Significant trees are defined in Section 810A of the Ordinance as trees (1) on property under the jurisdiction of the Department of Public Works or on privately owned-property with any portion of its trunk within 10 feet of the public right-of-way, and (2) that satisfies at least one of the following criteria: (a) a diameter at breast height (DBH) in excess of 12 inches, (b) a height in excess of 20 feet, or (c) a canopy in excess of 15 feet. The removal of significant trees by persons other than the Department of Public Works requires a permit from the Department, according to the process described in Section 806b. Landmark trees are trees that have been nominated as landmark trees by a member of the public, the landowner, the Planning Commission, the Board of Supervisors, or the Historic Preservation Commission, and that have been subsequently recommended as a landmark tree by the Urban Forestry Council (within the Department of the Environment), and then must be designated a landmark tree by ordinance approved by the Board of Supervisors. Trees that have been nominated and are undergoing review are protected according to the same standards as designated landmark trees while going through the review process, according to Section 810 of the Ordinance. There are no designated Landmark trees in the project area.

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would have minimal environmental impacts, in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs (see Table 5.4-3), as well as any mitigation measures identified by this Initial Study and adopted by the CPUC decision.

Table 5.4-3. Applicant Proposed Measures (APMs) Related to Biological Resources

APM Number	Issue Area
	Biological Resources
APM 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.

Table 5.4-3. Applicant Proposed Measures (APMs) Related to Biological Resources

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, CDFW 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 CDFW.
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 hydro-plowing 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.

Table 5.4-3. Applicant Proposed Measures (APMs) Related to Biological Resources

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. 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-6	**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 PEA 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. (Also see APM HM-6 and APM WQ-7.)

Table 5.4-3. Applicant Proposed Measures (APMs) Related to Biological Resources

APM WQ-10	**Sediment Monitoring and Response Plan.** Estimates of the amounts of material that may be suspended will vary depending on the specific type of equipment to be used. During final design, the expected equipment type will be identified and an evaluation can be made of the amount of sediment expected to be suspended. Along with the sediment quality information being gathered as described in APM WQ-8 and APM HM-7, this information will be used to determine, in coordination with the RWQCB, allowable thresholds of turbidity in the area of operations. A Sediment Monitoring and Response Plan will be developed in coordination with the RWQCB, taking into account equipment and the results of sediment sampling, that will set monitoring distance and methodology, acceptable thresholds of turbidity compared to background, and adaptive operational controls that will be used to reduce sediment suspension. These controls may include, but are not limited to, increasing or decreasing the speed of cable installation operation, increasing or decreasing the operational jet nozzle pressure, adjusting the operational angle of the jet nozzles on the burial blade, and other operational parameters that may reduce sediment suspension.

5.4.2 Environmental Impacts and Mitigation Measures

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 Wildlife or U.S. Fish and Wildlife Service?

LESS THAN SIGNIFICANT WITH MITIGATION – CONSTRUCTION. There are 11 special-status marine species and one special-status bat that may be present in the project area during construction. There are also at least 16 managed fish species likely to be found in the project area. The Proposed Project would construct 3.5 miles of transmission line: 2.5 miles of offshore submarine cable, 0.4 miles horizontal directional drilling to the bay, and 0.6 miles onshore in paved areas. The submarine cable installation would be 1,500 to 2,500 feet offshore, and cable would be installed 6 to 10 feet under the bay floor. Potential impacts to special-status species are described below. With implementation of the APMs in Table 5.4-3 and proposed additional mitigation identified herein, impacts on these species from project construction would be less than significant.

Note: None of the benthic organisms affected by the Proposed Project have special conservation status. Project activities would take place in soft bottom habitats that do not support eelgrass beds (given special-status under the Clean Water Act) or native oyster beds.

Fish. The submarine project route passes through habitat for at least 16 federally managed fish species (see Table 5.4-2); foraging and spawning habitat for Pacific herring; foraging habitat for several recreational fishery species and at least one species, California halibut (*Paralichthys californicus*) that is targeted in the bay by recreational and commercial fishing and suitable foraging habit for four listed fish: green sturgeon, Central California Coast coho salmon, Chinook salmon, California central coast steelhead, and longfin smelt. The San Francisco Bay is federally designated critical habitat for the southern DPS of North American green sturgeon and for the DPS of Central California Coast steelhead.

Installing submarine cable for the Proposed Project would require the use of a hydroplow towed by a barge, tugboats for positioning, and small boats towing HDPE conduit pipes. Fish could be temporarily affected by underwater noise and vibration. (Section 5.12, Noise, discusses baseline underwater noise levels in the environment, and this section addresses noise impacts on biological resources. The 2008 Fisheries Hydroacoustic Working Group determined that sound pressure levels of 206 dB peak and 187 dB accumulated could injure listed fish. Although no pile driving is planned, high pressure water jets used for underwater cable-laying may generate noise levels up to 185 dB at the source (Talisman, 2005). Because fish are generally sensitive to noise levels above those created by the project activity, and fish can be expected to quickly move away from underwater construction activities, this level of noise would not significantly impact fish in the project area.

Hydroplowing for cable installation would stir up and "fluidize" seabed material in a path 1 foot wide and 6 to 10 feet deep, over approximately 1 to 2 miles per day.[5] After cable is installed, most of the trench would close as fluidized sediments settle. Over the course of cable installation, 13,200 square feet of seabed would be disturbed. This process would create short-term increases in turbidity, disturbance of benthic habitats, and temporary localized loss of foraging habitat for some fish (City of Pittsburg, 2006a and b). The project would temporarily disturb a relatively small area of soft bottom habitat and a relatively small volume of open water habitat. Temporary impacts would affect approximately 13,200 square feet of soft bottom habitat; this represents one millionth of the 400 square mile San Francisco Bay (PG&E, 2013; NMFS, 2007a). Both soft bottom and open water habitats support organisms that are food sources for fish (including benthic invertebrates and plankton). However, these food source organisms are widely available in the San Francisco Bay and would rapidly re-colonize disturbed bottom areas. These food sources are also replenished by twice daily tidal water exchanges. Any effects of the project on food resources for fish would be very minimal and less than significant. In addition to increasing turbidity, fluidizing seabed material during cable installation would mobilize contaminants, including polychlorinated biphenyl (PCBs) and polycyclic aromatic hydrocarbons (PAHs) from known areas of contamination (SFEI, 2009; see Section 5.9 [Hydrology and Water Quality] for more detail). Horizontal directional drilling (HDD) could also result in inadvertent release of drilling fluid from the HDD bore holes or exit pits at the bottom of the bay floor that would affect water quality. Exposure to these contaminants could pose health risks to some foraging fish in the vicinity of construction activities (Brar et al., 2010). APM BIO-5 commits PG&E to acquiring the necessary permits for installing cable in the San Francisco Bay. Acquiring these permits would require consultation with wildlife and water quality agencies and implementation of subsequent avoidance and minimization measures. Measures to protect water quality, including APM WQ-6 (Drilling Monitoring and Management Plan) and APM WQ-10 (Sediment Monitoring and Response Plan), require PG&E to implement best management practices for monitoring and spill containment during HDD and to coordinate with the Regional Water Quality Control Board (RWQCB) in determining thresholds for turbidity and implementing a plan to minimize turbidity by changing cable installation speed, jet pressure, or other equipment parameters. With the implementation of these measures, impacts on fish from impaired water quality would be less than significant.

Up to 5 percent of the underwater cable (650 feet) that cannot be buried due to obstructions on the preferred route may need to be covered by concrete "blankets" or steel half-pipe sections up to 50 feet wide. Benthic habitat and organisms would be affected along sections of the transmission line covered by steel pipes or concrete mats where subsurface burial is not possible. Total area covered by concrete or steel pipe would be up to 32,500 square feet or 0.001 square miles of the 400-square-mile bay floor. This would constitute a permanent, but less-than-significant, loss of the soft-bottom benthic habitat in these areas.

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[5] The hydroplow would be equipped with a burial blade lined with adjustable hydraulic pressure nozzles or jets directed downwards and back to fluidize the underlying sediments. The high pressure water flow from this blade results in a down and back flow of sediments, or mass flow, within the trench, which is typically 2-3 feet wide, fluidizing the sediment column to the desired depth as the equipment progresses along the identified route allowing the cable to settle into the trench under its own weight (taking advantage of density difference between fluidized sediment and cable). Typically during hydraulic jetting operations, between 70 and 75 percent of the sediment remains within the cable trench. (PG&E, 2013)

Non-native invasive species are widespread in San Francisco Bay. Several invasive species have the potential to occur in the sediment of the project area. These include Asian clam (*Corbicula fluminea*), Chinese mitten crab (*Eriocheir sinensis*), and European green crab (*Carcinus maenas*) (USGS, 2012). These species may be disturbed by the project, but are unlikely to be more widely distributed as a result. There are no hard bottom, riprapped areas, reefs, structures such as pier pilings that would be impacted by the project. Therefore, invasive species that attach themselves to these surfaces (such as bryozoans, tunicates, and other sessile encrusting organisms) would not be affected by the project. However, the hydroplow, vessels, barges, or any other floating equipment that does not originate in the San Francisco Bay could introduce marine invasive species. With the implementation of Mitigation Measure B-1 (Implement an Invasive Marine Species Control Plan), this impact would be less than significant.

Fish could be injured or killed by collisions with or entrapment by construction equipment during cable installation. Foraging green sturgeon, coho salmon, Chinook salmon, and steelhead would likely avoid project equipment; however, longfin smelt, which are typically found in the middle to lower water column, could be entrained/impinged. Because longfin smelt is listed as threatened by the state and is a candidate for federal listing, injury or mortality of longfin smelt would be a potentially significant impact. APM BIO-3 (seasonal work windows) requires PG&E to coordinate with NMFS, USFWS, and CDFW if marine construction work is planned outside March 1 to November 30, which is the window for protection of Pacific herring. Monitoring and reporting of injury or mortality of longfin smelt would be required by Mitigation Measure B-3 (Protect marine species), which supplements APM BIO-6. Mitigation Measure B-3 would require PG&E to consult with CDFW and outlines performance standards and monitoring requirements for fish screens. If CDFW determines that an Incidental Take Permit for longfin smelt is necessary, the agency may require additional protective measures such as supplemental monitoring requirements or restrictions on equipment use. With the implementation of these measures, impacts on listed fish would be less than significant.

The project is unlikely to affect green sturgeon, coho salmon, Chinook salmon, or steelhead because of the relatively minimal project footprint (compared to the foraging habitat available in the Bay) and because construction impacts would be temporary. With the implementation of APM BIO-1 (general biological resources protection measures), APM BIO-3 (seasonal work windows), APM BIO-5 (Aquatic Habitat Protection, compliance with permits), water quality protection measures (APM WQ-1, APM WQ-6, and APM WQ-10), and Mitigation Measure B-3 (Protect marine species) these impacts would be less than significant. With the implementation of APM BIO-1, APM BIO-3, and APM BIO-4, impacts on Pacific herring would also be less than significant.

Birds. The onshore project area does not have any known habitat for special-status birds. However, even birds that do not otherwise have special-status are protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code. The MBTA prohibits killing, possessing, or trading in any migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. Further, raptors (e.g., eagles, hawks, and owls) and their nests are protected under both federal and State regulations. California Fish and Game Code Section 3503 prohibits the needless destruction of the nest, eggs, or young of any bird covered under the MBTA and Section 3503.5 prohibits the destruction of raptor nests, eggs, or young. Construction disturbance, including tree trimming and tree removal, during the breeding season and avian nesting season that regularly occurs from February 15 through August 31 could adversely affect breeding birds through direct take or indirectly through disruption or harassment. Migratory birds and other birds covered by California Fish and Game Codes Sections 3503 and 3801 could nest in ornamental trees or in structures near project work areas. See Table 5.4-1 for locations of large, mature trees along the project route that may provide nesting habitat. Depending on the precise location of the underground line (determined during final design), some of these trees may need to be removed or trimmed. One entire row of 18 sweetgum trees (2 to 3 inches in diameter and 10 to 15 feet tall) on Spear Street between Folsom Street and Harrison Street could potentially be trimmed or removed during construction (PG&E, 2013); however, these trees are not as large and mature as other trees in the project area and are not likely to support nesting birds.

Because of the urban environment, nesting birds in the project area would likely be somewhat tolerant of noise, dust, and vibration from construction. However, some construction activities in close proximity to nests may still disturb nesting birds, potentially causing nest failure. Section 5.12, Noise, describes the baseline noise levels as being between 60 to 70 dBA in the project area. Table 5.12-4 shows the construction noise levels along the onshore project route. Construction noise could be disruptive along the corridor as it would reach a maximum of 83 dBA at 50 feet from the activity. In addition, tree trimming and tree removal could disturb or even kill nesting birds, which would be a potentially significant impact. APM BIO-1 (general measures) and APM BIO-2 (preconstruction surveys for nesting birds) would reduce potential impacts on birds and their nests. However, PG&E's APM BIO-2 lacks the necessary specificity to ensure that impacts to nesting birds would be less than significant. Mitigation Measure B-4 (Avoid impacts to nesting birds) supersedes APM BIO-2 and includes the following additional requirements: pre-construction surveys to be conducted within 7 days before work activities (a time window that is necessary to ensure that nests are identified); surveys to be led by a qualified biologist approved by the CPUC; and appropriate protective measures to be implemented in coordination with CPUC. With the implementation of these measures, impacts to nesting birds would be less than significant.

Marine Mammals. There are four marine mammals (protected by the federal MMPA) that may be present in the project area: Pacific harbor seal, California sea lion, harbor porpoise, and gray whale. Marine mammal species could be temporarily affected by water-borne noise and vibration, sediment displacement, mobilization of contaminants, or collisions with equipment during placement of submarine cable in the San Francisco Bay. Tugboats and small vessels would be sources of noise comparable to those occurring in the setting. Clamshell dredging would be needed for the excavation pits; however, no pile driving is planned. Underwater noise levels from high pressure water jets for cable-laying could reach 185 dB at the source (Talisman, 2005). PG&E proposes to use a hydroplow with low pressure water jets that would cause less noise and generally be engaged below the seabed, which would also act to attenuate or dampen noise generated by the water jets (PG&E, 2013). Elevated source levels that would occur from the project activities would diminish for locations away from the source to become comparable to the background ambient conditions at a distance of about 800 feet. However, in the immediate vicinity of the dredging or cable-laying, the submarine conditions may exceed the NMFS Level A threshold 180 dB, which could cause physical injury or significantly disrupt the behavioral patterns of marine mammals. To avoid this impact, mitigation would establish a biologist with the authority to stop or modify work to avoid a substantial disruption of marine mammal behavior. Mitigation Measure B-2 (Protect marine mammals from high noise levels) was developed based on review of available technical information and on informal consultation with NMFS. Mitigation Measure B-2 would require PG&E to curtail activities and avoid causing underwater noise that results in a disruption of behavior. With the implementation of this measure and APMs BIO-1, BIO-5, and APMs WQ-1, WQ-6, and WQ-10, impacts on marine mammals would be less than significant.

LESS THAN SIGNIFICANT – OPERATION AND MAINTENANCE. After project construction, operation and maintenance of the Embarcadero Substation and Potrero Switchyard would remain the same as before implementation of the Proposed Project. There would be some additional disturbance of the Central Bay for periodic maintenance and repair of buried cable. Potential impacts to special-status species from maintenance and repair activities would be the same as those described above for construction, but at a much smaller scale. These impacts would be potentially adverse, but less than significant.

Mitigation Measures for Special-Status Species

MM B-1 **Implement an Invasive Marine Species Control Plan**. PG&E shall develop and implement an Invasive Marine Species Control Plan prior to any in-water work. The plan shall include measures designed to effectively limit the introduction and spread of invasive marine species. PG&E shall submit this plan to the CPUC for approval at least 60 days before the start of marine activities. Vessels originating outside San Francisco Bay shall follow existing compliance measures established by the California State Lands Commission as part of the Marine Invasive Species Program, relating to hull fouling and ballast water control. In addition, if used outside the San Francisco Bay area prior to use on this project, the hydroplow and associated equipment shall be examined and any invasive species handled and disposed of according to the developed plan. Similarly, if the equipment is to be used outside the San Francisco Bay after this use, the equipment shall be examined and cleaned prior to leaving the area.

PG&E shall coordinate plan preparation with the CPUC, U.S. Coast Guard, U.S. Army Corps of Engineers, National Marine Fisheries Service [NMFS], Regional Water Quality Control Board, and California Department of Fish and Wildlife [CDFW] as appropriate. The plan shall include: environmental training for all crew members working in marine areas addressing invasive marine species and actions to be taken to prevent release and spread of invasive marine species. Training shall include procedures for safe removal and disposal of any invasive species found on project equipment. Before and after boats and equipment leave the water, a qualified biologist (approved by the CPUC) shall assist crew members in removing plants, plant debris, and any other potentially invasive species.

MM B-2 **Protect marine mammals from high noise levels.** PG&E shall consult with the National Marine Fisheries Service (NMFS) to determine whether Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) for marine mammals is necessary. If NMFS determines that an IHA or LOA is not necessary, PG&E shall submit evidence of this determination to the CPUC prior to the start of marine construction activities.

Monitoring. PG&E shall prepare and implement a Marine Mammal Monitoring Plan. PG&E shall submit this plan to the CPUC for approval before the start of marine activities. The Marine Mammal Monitoring Plan shall include the following elements:

- Establishment of an appropriate buffer zone around the work area, generally 400 feet or as defined in consultation with NMFS, that would require work be slowed or otherwise modified if the work approaches a marine mammal within the established buffer zone.
- A qualified biologist (approved by the CPUC) shall be on board the hydroplowing ship during construction.
- The qualified biologist shall monitor marine mammal presence and behavior in the vicinity of the ship and the surface above hydroplow operations.
- The qualified biologist shall have the authority to slow or stop work, if safe to do so, and shall consult with the CPUC and NMFS about the implementation of additional minimization measures if, based on observations, project construction appears to be disrupting marine mammal behavior in ways that indicate harassment or injury.

- Any disruption of marine mammal behavioral patterns shall be reported to the CPUC and NMFS within two working days with a description of actions taken to curtail work and reduce noise source levels and a demonstration that the disruption caused no potential for injury or mortality.
- PG&E shall submit weekly reports of marine mammal observations to the CPUC during marine construction activities.

As an alternative to preparing and implementing the Marine Mammal Monitoring Plan specified in this mitigation measure, PG&E may provide adequate evidence, to the CPUC for approval at least 30 days before the start of marine activities, based upon actual data collected for this project or other projects using similar equipment in a similar submarine environment, that demonstrates to the satisfaction of the CPUC that underwater noise source levels generated by the project hydroplow and marine activities cannot not be reasonably expected to exceed the 180 dB threshold recently used by NMFS for marine mammal protection.

MM B-3 **Protect marine species**. PG&E shall consult with CDFW to obtain an Incidental Take Permit for longfin smelt or a determination from the agency that the project is not likely to adversely affect longfin smelt.

Fish screens. As stated in APM BIO-6, all hydroplow water jet intakes shall be covered with a mesh screen or screening device to minimize potential for impingement or entrainment of fish species, especially longfin smelt. Additional requirements to minimize or prevent entrainment and impingement are also required to supplement APM BIO-6:

- The mesh screen or screening device shall comply with applicable state (CDFW) and federal (NMFS) criteria for screening intakes such as those found in NMFS's 1996 *Juvenile Fish Screen Criteria for Pump Intakes* or as required by NMFS and CDFW.

Monitoring. A qualified biologist (approved by CPUC) shall verify that the screens are in place at the beginning of each hydroplow work period and examine them for impinged longfin smelt or other fish species at the end of each work period, or whenever the screens are cleaned or the hydroplow is raised out of the water during the cable laying. Injury or mortality shall be reported to CPUC within two working days, with a discussion of actions taken to prevent or minimize any additional longfin smelt injury or mortality or as otherwise determined with CDFW and NMFS. Any injury or mortality of longfin smelt shall also be reported as determined in permitting discussions with CDFW and NMFS.

MM B-4 **Avoid impacts to nesting birds.** This measure supersedes APM BIO-2. If onshore construction activities occur during the avian nesting season, a preconstruction survey for nesting birds shall be conducted by a qualified wildlife biologist (PG&E employees or contractors, approved by the CPUC) within 7 days prior to the start of noise-generating construction or vegetation trimming or removal activities in any new work area. Surveys shall cover all public areas within 50 feet of work sites. For San Francisco County, the avian nesting season regularly occurs between February 15 and August 31, but a survey may be appropriate earlier or later depending on species, location, and weather conditions as determined by the qualified wildlife biologist.

Work areas that cause no appreciable increase in ambient noise, such as where work is performed manually, by hand, or on foot and activities that cause no observable disturbances to nesting birds (e.g., operating switches, driving on access roads, normally occurring activities at substations, staging or laydown areas) would not warrant a preconstruction survey.

Protective measures for birds. If an active bird nest for a species covered by the Migratory Bird Treaty Act or California Fish and Game Code is found within 50 feet of project work areas, the qualified biologist shall determine appropriate protective measures to reduce the likelihood of nest failure. Protective measures for active nests shall include one or more of the following: avoiding or limiting certain project-related activities within a designated buffer zone surrounding the nest, shielding of the nest from project disturbance using a temporary soundwall or visual screen, or other shielding method as appropriate. The width of the buffer zone (in which work may not occur) shall be based on the disturbance tolerance and conservation status of the species, and the nature of planned construction activities and other human activities in the immediate area. Buffer zones of less than 50 feet shall be allowed only when planned construction activities involve relatively low disturbance or birds have demonstrated tolerance of noise and disturbance. Buffers shall not apply to construction-related vehicle or pedestrian traffic using city streets and sidewalks. As appropriate, exclusion techniques may be used for any construction equipment that is left unattended for more than 24 hours to reduce the possibility of birds nesting in the construction equipment. An example exclusion technique is covering equipment with tarps.

Bird species found building nests within the work areas after specific project activities begin may be assumed tolerant of that specific project activity; the CPUC approved, qualified biologist shall implement an appropriate buffer or other appropriate measures to protect such nests, after taking into consideration the position of the nest, the bird species nesting on site, the type of work to be conducted, and duration of the construction disturbance.

Protective measures for special-status birds. If an active nest for a special-status bird is found, PG&E shall record the position of the nest in the monitoring report and notify the CPUC through the reporting process outlined below. The qualified biologist shall implement buffers and set other protective measures (described above), as appropriate, to protect special-status nesting birds from construction activities in consultation with CPUC, and as appropriate the California Department of Fish and Wildlife (CDFW) and/or United States Fish and Wildlife Service (USFWS). Buffer zones of less than 50 feet shall be allowed only when planned construction activities involve relatively low disturbance or birds have demonstrated tolerance of noise and disturbance. Requests for buffers of less than 50 feet for special-status nesting birds must be submitted to the CPUC's independent biologist(s) for review. The CPUC's independent biologist shall respond to PG&E's request for a buffer reduction (and buffer reduction terms) within one business day; if a response is not received, PG&E can proceed with the buffer reduction. If nesting birds in the presence of the CPUC-approved qualified biologist show signs of intolerance to construction activities within a reduced buffer zone, the qualified biologist shall reinstate the recommended buffer. The recommended buffer may only be reduced again following the same process, as identified above, and after the CPUC-approved, qualified biologist has determined that the nesting birds are no longer exhibiting signs of intolerance to construction activities. Nests shall be monitored daily by the qualified biologist when construction is active at that location. Any potentially significant construction-related disturbance shall be reported to CPUC, CDFW, and USFWS.

Monitoring. Active nests shall be monitored at least once daily during construction until nestlings have fledged and dispersed or until nest failure has been documented. Daily nest checks shall be at least 30 minutes or more as determined by the qualified biologist 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 qualified biologist shall record the 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. The qualified biologist shall 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. If the qualified biologist determines that project activities are contributing to nest disturbance, they shall notify CPUC (and CDFW/USFWS as appropriate in the case of special-status bird nests) and coordinate with the Construction Manager to limit the duration or location of work, and/or increase appropriate protective measures (as described above).

Reporting. If there are active nests present within 50 feet of the project area during construction, a weekly written report shall be submitted to CPUC. A final report shall be submitted to CPUC at the end of each nesting season summarizing all nest monitoring results and nest outcomes for the duration of project construction. No avian reporting shall be required for construction occurring outside of the nesting season and if construction activities do not occur within a reduced buffer during any calendar month. Nests located in areas of existing human presence and disturbance, such as in yards of private residences, or within commercial and or industrial properties are likely acclimated to disturbance and may not need to be monitored, as determined by the CPUC-approved, qualified biologist and approved by the CPUC's independent biologist.

Permits. Prior to the start of construction, PG&E may obtain a permit authorized by Section 3503 and/or Section 3503.5 of the California Fish and Game Code, or by any regulation adopted pursuant thereto, pertaining to nesting birds. If PG&E obtains such a permit under the above authorities, where that permit conflicts with the measures outlined above, the conditions of the permit shall govern.

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, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

LESS THAN SIGNIFICANT. There is no riparian habitat or other sensitive natural community in the project area. There are no eelgrass beds, nor are there any planned eelgrass or shell bed restoration projects in the area (SCC, 2012). Intertidal mudflats would not be affected by cable installation or drilling. The project area contains critical habitat for the southern DPS of North American green sturgeon and the DPS of Central California Coast steelhead. However, as described in Section 5.4.2(a), habitat and food resources for this species would not be significantly affected by the localized and largely temporary impacts of the project. Therefore, the impact to natural communities would be less than significant.

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.) either individually or in combination with the known or probable impacts of other activities through direct removal, filling, hydrological interruption, or other means?

NO IMPACT. There are no wetlands in the project area; therefore, there would be no impact.

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 wildlife nursery sites?

LESS THAN SIGNIFICANT WITH MITIGATION. As described in Item (a), fish and other wildlife (including marine mammals) may be temporarily displaced during cable installation and HDD. These impacts would primarily affect bottom-dwelling species in the immediate path of hydroplowing and at the HDD entrance. Species in the middle and upper water column would likely continue to use those portions of the water column during project construction. Salmonids, North American green sturgeon, longfin smelt, and other special-status fish do not spawn in the Central Bay. These species either spawn in freshwater habitats, or calmer brackish areas further up the delta and the larvae develop into sub-adults in these regions. Therefore, there are unlikely to be any eggs or larvae of any special-status species in the project area. The project area is outside the primary migration corridors for special-status anadromous fish. Potential impacts to herring spawning would be less than significant with the implementation of APM BIO-4. The nearest marine mammal haul-out site is on the far side of Treasure Island and would not be affected by the project (PG&E, 2012). With the implementation of APMs BIO-1, BIO-3, BIO-5, BIO-6, and Mitigation Measures B-1, B-2, and B-3, impacts to the movement of marine wildlife would be less than significant. Impacts on nesting migratory birds would be less than significant with the implementation of Mitigation Measure B-4.

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

LESS THAN SIGNIFICANT WITH MITIGATION. The San Francisco General Plan includes goals (listed in the Applicable Regulations section above) related to the protection of biological resources. The Proposed Project would cause temporary disturbance that could affect some disturbed onshore vegetation, landscaped areas, and some wildlife, including special-status bats and marine species. In addition, the Proposed Project may require the removal or trimming of some street trees (covered by San Francisco's Urban Forestry Ordinance). PG&E would obtain and comply with all relevant permits from the Department of Public Works if removal of street trees is required. There are no Landmark trees in the project footprint; the nearest Landmark tree is on Pennsylvania Avenue near 22nd Street (SF Environment, 2013).

With the implementation of APMs BIO-1 through BIO-7, and water quality-related APMs WQ-1, WQ-6, and WQ-10, and Mitigation Measures B-1, B-2, B-3, and B-4 impacts that could conflict with the San Francisco General Plan goals (outlined in Applicable Regulations) would be less than significant.

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities 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 project area; therefore, there would be no impact.

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5.5 Cultural Resources

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 §15064.5?	☐	☐	☒	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §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?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

5.5.1 Setting

Information presented in this section is based on a review of the Proponent's Environmental Assessment (PG&E, 2012a) and including the PEA Appendix D, Cultural Resources Inventory and Archaeological Sensitivity Analysis (Nolte et al., 2012).

Regulatory Background

Cultural Resources

Public Resources Code Section 5024. The California Public Resources Code (PRC Section 5024), enabled by CEQA, 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 historical resources for the purposes of CEQA.

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

The CRHR sets forth four criteria for evaluating the eligibility of a cultural property. These criteria closely parallel the National Register of Historic Places (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 CCR, 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 Health and Safety Code, 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…?" 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.

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 consist 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 Bulletin No. 9 and No. 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 that are listed on the NRHP, the CRHR, or are National Historic Landmarks. San Francisco Preservation Bulletin Numbers 1 through 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 the 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.

Approach to Analysis of Cultural Resources and Previous Cultural Resources Studies

Existing Information Review

A records search was performed at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) on April 20, 2012. The records search conducted for the proposed route centered on the alignment and included a one-quarter mile buffer on either side. 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, California Historical Landmarks, the California Inventory of Historic Resources, and California Points of Historical Interest. The records 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 California State Lands Commission, the J. Porter Shaw Library in the San Francisco Maritime National Historical Park, the San Francisco Maritime Museum archives, NOAA Office of Coast Survey's Automated Wreck and Obstruction Information System (AWOIS), Sonoma State University, the California State Library and various on-line sources.

A search of the Sacred Lands Files maintained by the Native American Heritage Commission (NAHC) 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 that 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 Nolte et al. (2012).

Sensitivity Model

The possibility of encountering potential historical resources, and buried archaeological sites in particular, is a practical problem for resource managers who must make a reasonable effort to identify such resources or sites in a three-dimensional project area, ensuring that such potential historical resources are not affected by project activities. Since the Proposed Project would be located in an urban setting, surface survey offers little likelihood of identifying archaeological sites. Similarly, surface survey would not identify archaeological sites that have been buried by natural deposition or construction fill. The following approach was used to address this issue.

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 used as fill as the city grew. Areas around 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). The San Francisco Planning Department GIS database was consulted for the potential presence of storeships and other maritime resources in the northern, onshore portions of the transmission cable route. 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 Area of Potential Effects (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 miles of onshore route along the proposed route alignment
- A windshield survey was conducted for paved and built areas that 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 GenOn Site (0.85 acres contained within the Potrero Switchyard area)

Archaeological Survey

The archaeological survey for the northern extent of the proposed route encompassed Folsom Street between First 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 portions of the proposed route's 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 GenOn 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.

Marine Geophysical Survey

A maritime archaeologist reviewed the *Final Embarcadero to Potrero ZA-1 230KV Underground Transmission Project Feasibility Study* prepared by Black and Veatch for PG&E (B&V Project No. 173915.42.3008). A review of the Black and Veatch report included a detailed examination of Exhibit K, *Final Report, Submarine Utility Corridor Investigation, Marine Geophysical Survey, Proposed AZ-1 Transmission Line, San Francisco Bay, California* (OSI Report No. 11ES057), the geophysical report prepared by Ocean Surveys, Inc. (OSI) for Black and Veatch. The review also included a detailed examination of the digital geophysical datasets collected by OSI, specifically the side scan sonar and magnetometer data. Although OSI collected a suite of geophysical data, the datasets most relevant to an evaluation of the potential that historical resources in the form of cultural/archaeological deposits are present within the APE are the side scan sonar imagery and the magnetometer data. As detailed in the OSI report, side scan sonar uses acoustical data to create an image of the sea floor, while the magnetometer records variations in the earth's magnetic field that may represent ferrous metal objects. The side scan sonar imagery records objects visible above the sea floor, while the magnetometer can determine the presence of either visible or buried material. Used together, the instruments are the primary tools used by maritime archaeologists to determine the presence of submerged cultural resources, primarily shipwrecks.

The OSI survey employed state-of-the-art hardware (Klein 3000 Dual 100/500 kHz Side Scan Sonar and Geometrics G-882 Cesium Marine Magnetometer) and software (HYPACK navigation and data collection software) to collect side scan sonar and magnetometer data. OSI also employed industry standard data collection methodology, covering the entire length of the 600-ft wide survey corridor using 50-ft lane spacing. The instruments and methodology used by OSI are considered entirely adequate for determining the presence of submerged cultural resources.

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 a 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 (1) the commonness or "uniqueness" of the remains themselves, and (2) the probability that any will be encountered during excavations.

In particular the Society of Vertebrate Paleontology (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 paleontological specimens. More recently the BLM's *Informational Memorandum 2009-009* (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.

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).

Table 5.5-1. Paleontological Sensitivity Ratings Employed

Category 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 on 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.

Table 5.5-1. Paleontological Sensitivity Ratings Employed

Category of Paleontological Sensitivity	Definition
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 Paleontological Resources B Standard Guidelines (SVP, 1995) and the U.S. Bureau of Land Management's Informational Memorandum 2008-009 (BLM, 2008)

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 project area 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).

Paleoenvironment

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 on the northern slope of Rincon Hill, immediately south of the shore 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 the leveling of 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 portions of this surface along with any associated archaeological deposits. These factors further reduce the potential of discovering buried prehistoric archaeological deposits beneath the Bay Mud in this part of the 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 archaeological 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 (CA-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 (7 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 (CA-SFR-151/H) indicates that a period of widespread dune deposition around 1,000 years ago probably buried several archaeological sites in this area.

Prehistory

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 sequentially number 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, 1910; 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.

Seven prehistoric shellmidden sites (CA-SFR-2, -113, -114, -147, -155, -154/H, and -175) have been determined eligible for the National Register of Historic Places as part of a "Prehistoric Native American Shellmiddens on Mission Bay" National Register District (ASC, 2010:45) (the "District"). These sites are considered to represent elements of a multi-village community network that was clustered around the shore of Mission Bay (ASC 2010:45; Luby et al., 2006). No boundaries have yet been developed for the District, and the full extent of the seven buried sites has never been determined. However, it is clear that all land routes, including the land portions of the proposed route and the alternative land routes, though not the submarine portion of the proposed route, pass through the District. Sites SFR-2 and SFR-154/H are immediately adjacent to those routes.

Ethnography

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). A detailed summary of the ethnohistoric context for the study area is provided in Nolte et al. (2012).

Regional History

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.

A detailed summary of the historical context for the study area is provided in Nolte et al. (2012).

Local Setting

Record Search Results

Record search results are summarized below for the proposed route alignment, as well as the 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 Nolte et al. (2012).

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 the Embarcadero Substation at the north end of the Proposed Project. The prehistoric component of the site consists 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 (former 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 were conducted 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 levels 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 subject 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 nineteenth-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 city 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 former 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 California State Lands Commission (CSLC) 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. The San Francisco Planning Department updated information in the CSLC database using research provided by the Institute for Western Maritime Archaeology. Additional potential shipwreck locations are maintained in the San Francisco Maritime Museum archives. Additional information about shipwreck locations along the submarine portion of the transmission cable alignment was sought at the J. Porter Shaw Library at San Francisco Maritime National Historical Park. The NOAA Office of Coast Survey's AWOIS database was also consulted for information about potential shipwrecks along the submarine portion of the transmission cable alignment. There are six named shipwrecks mapped within one-half mile of the project area listed in the CSLC database. These are primarily located in the Mission Bay and China Basin areas. The location of only one of these shipwrecks has been confirmed. The AWOIS database and NOAA Chart no.18650 depict a charted shipwreck in the vicinity of the transmission cable alignment. No information is known about the shipwreck other than its location, size, and orientation.

In addition, other potential ship-related sites exist along the northern, onshore portion of the cable route. In 1988, archaeological investigations at the Hills Plaza site (CA-SFR-115H), located on Steuart Street between Harrison and Folsom streets, uncovered remnants of Charles Hare's ship-breaking yard. Artifacts and timbers from at least four dismantled vessels were found. Based on their distribution, it was thought likely that the site extended southwest beneath Spear Street. In 2005, investigations at 300 Spear Street uncovered additional evidence of Hare's yard and the stern portion of the early nineteenth century whaling ship, *Candace*. The forward section of the vessel was not recovered as it extended under Folsom Street between Main and Spear streets. Additional artifacts and features relating to Hare's ship-breaking yard likely exist under Spear and Folsom streets.

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. The San Francisco Planning Department GIS database was consulted for the potential presence of storeships and other maritime resources in the northern, onshore portions of the transmission cable route. 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. There are no storeships currently mapped in the project's area of direct impact. There are, however, three potential storeships mapped within one block of the area, two on Beale between Folsom and Howard streets, and one on Main between Folsom and Howard streets. The locations of many other storeships are still not known.

Built Environment

The NWIC record 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 (Nolte et al., 2012). 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 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 of the proposed transmission route would be through Holocene deposits of Bay Mud, and the proposed HDD would 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 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.

Native American Consultation

PG&E sent requests for information to the eight NAHC-recommended contacts who may have additional information concerning archaeological sites or traditional cultural properties near the project area. 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 Nolte et al. (2012).

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 above 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 offshore, submarine portion of the transmission route has a low level of prehistoric archaeological sensitivity. The archaeological sensitivity for historical resources in the submarine portion of the transmission route is discussed below.

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 are 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 Nolte et al., 2012).

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 5.5-2 provides a summary of site sensitivity in the project areas.

Table 5.5-2. Site Sensitivity in the Proposed Project Areas

Alternative	Prehistoric Sensitivity/Sites	Historical Sensitivity/Sites	Built Environment Resources
Proposed Route	Low	Moderate to High	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 Nolte et al., 2012). 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 5.5-3 as either in the northern or southern portion of the route, and graphically presented in Nolte et al. (2012). There are no buildings or structures along the submarine section of the proposed route.

Table 5.5-3. Buildings Along or Adjacent to Onshore Portions of the Proposed Route

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).
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.

Table 5.5-3. Buildings Along or Adjacent to Onshore Portions of the Proposed Route

Building/Location	Regulatory Summary	Eligibility
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).
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 (now GenOn)	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 (Nolte et al., 2012).
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 (Nolte et al., 2012).

Table 5.5-3. Buildings Along or Adjacent to Onshore Portions of the Proposed Route

Building/Location	Regulatory Summary	Eligibility
Building 20: 2349 – 2353 Third 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 (Nolte et al., 2012).
Building 21:2501 Third 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).

Marine Geophysical Survey Results

The results of the Marine Geophysical Survey indicate a variety of small, isolated side scan sonar targets and magnetometer anomalies throughout the survey area. These are typical results expected in a harbor that has had an active maritime industry for more than 150 years. OSI documented 106 side scan sonar targets (OSI, 2011:Appendix 3). The majority is identified as isolated "linear" or "oblong" objects varying in length from 3 ft. to 220 ft. Five targets are identified as tires or groups of tires; one target (SS62) is identified as a rectangular object measuring 19 ft. long by 7 ft. wide by 2 ft. high, which OSI indicated as a possible wreck. There is no magnetic anomaly directly associated with the target (the nearest magnetic anomaly is approximately 80 ft. north), and additional review by a maritime archaeologist suggests the object is unlikely to be a shipwreck, but is most likely an isolated piece of non-ferrous debris. The most striking side scan sonar target recorded in the survey area is a large shipwreck located in the northeastern portion of the survey area. The target is approximately 300 ft. long by 150 ft. wide and is located approximately 165 ft. east of the 600-ft survey corridor centerline, extending outside the survey corridor. The side scan sonar target corresponds to the charted wreck location from NOAA's AWOIS database (see above). Review of the side scan sonar data by a maritime archaeologist revealed that no other targets of interest were recorded.

OSI recorded 272 magnetic anomalies in the survey area, ranging in size from less than 20 gammas to nearly 15,000 gammas (OSI, 2011: Appendix 4). The majority of the anomalies are low to moderate intensity and of short duration, indicating they are likely caused by isolated ferrous masses. Additional processing of the magnetometer data using magnetic gradient processing, which looks for changes in the earth's magnetic field over short distances, helped to isolate magnetic anomalies that may be associated with cultural objects such as shipwrecks. The largest magnetic anomaly recorded during the OSI survey, which is nearly 15,000 gammas, is associated with the shipwreck also recorded by the side scan sonar (see above). The extremely large magnetic anomaly associated with the shipwreck suggests the vessel is iron or steel. There are a number of large magnetic anomalies associated with piers at both the southern and northern ends of the survey area and associated with the Trans Bay Cable in the southern end of the survey area. One additional magnetic anomaly recorded within the survey area is of interest. The anomaly is an 800 gamma anomaly with a 368-ft duration located in the southern half of the survey area (identified by OSI as anomaly no. M63 at 6019099E, 2106491N). There is no side scan sonar target associated with M63, indicating that the source of the anomaly is buried beneath the bay floor. Although it is impossible to predict the size or composition of the ferrous material causing the anomaly, the high intensity and long duration suggests it is either a very large, isolated ferrous object or a cluster of smaller ferrous masses.

Because the survey area has been part of an active commercial port for more than a century-and-a-half, there are a large number of small, isolated side scan sonar targets and magnetometer anomalies that create a relatively noisy geophysical environment. Despite this fact, a review of the geophysical data by a maritime archaeologist revealed that, with the exception of the shipwreck described above and the single, large magnetic anomaly, the cable route is relatively clean in regards to potentially significant historical archaeological resources. The majority of the side scan sonar targets and magnetometer anomalies recorded during the OSI survey likely represent small, isolated objects that do not need to be considered during transmission cable installation. It is possible, however, that the noisy geophysical environment within the survey area has masked targets or anomalies that may be associated with unrecorded historical resources.

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study (see Table 5.5-4).

Table 5.5-4. Applicant Proposed Measures (APMs) Related to Cultural Resources and Paleontological Resources

APM Number	Issue Area
	Cultural Resources and Paleontological 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.

Table 5.5-4. Applicant Proposed Measures (APMs) Related to Cultural Resources and Paleontological Resources

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.** A professional archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards will monitor all project-related on-shore excavation that is within an area of moderate to high sensitivity for prehistoric or historical buried resources, as such areas are presented in PEA Appendix D (Nolte et al. 2012). This shall include monitoring areas within 167 feet (50 meters) of recorded or previously identified prehistoric and historical-era sites or features. APM CUL-3 will be guided by an Archaeological Monitoring and Inadvertent Discovery Plan, which will include the framework for evaluation and treatment of any unanticipated discoveries described in APM CUL-4. In addition to the monitoring archaeologist, a qualified maritime archaeologist will be on call during construction to assist with implementation of the Archaeological Monitoring and Inadvertent Discovery Plan should maritime resources be identified during excavation. If appropriately qualified, the same person may act as both the monitoring archaeologist and maritime archaeologist. This APM CUL-3 in combination with APM CUL-4 will ensure that archaeological resources will not be impacted during construction without adequate evaluation and any necessary actions (as further detailed in APM CUL-4 and the Archaeological Monitoring and Inadvertent Discovery Plan) to preserve information regarding impacted resources. Site assessment procedures and data recovery or other measures will be developed as part of the Archaeological Monitoring Plan and applied during the monitoring process.
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 the 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).

Table 5.5-4. Applicant Proposed Measures (APMs) Related to Cultural Resources and Paleontological Resources

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 PEA Appendix D (Nolte et al. 2012) 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, and the brick wall that fronts Station A and that serves as a visual barrier will be partially or completely removed. Prior to construction, the setting and exterior of the Station and brick wall 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.
APM CUL-8	**Apply Secretary of the Interior Standards for the Treatment of Historic Properties to Brick Wall Modifications.** The gate in the brick wall that fronts Station A will be widened and the wall removed or modified to allow access for large transformer equipment and future maintenance activities. Modifications to or removal of the wall will follow the Secretary of the Interior Standards for the Treatment of Historic Properties (available at http://www.nps.gov/hps/tps/standguide/) and will be designed to be compatible with the historic character of Station A. PG&E will submit a draft of its design for the brick wall modifications to the Commission no less than 30 days prior to any alteration of the wall.
APM 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.

5.5.2 Environmental Impacts and Mitigation Measures

a. *Would the project cause a substantial adverse change in the significance of an historical resource as defined in §15064.5 [§15064.5 generally defines* historical resource *under CEQA]?*

LESS THAN SIGNIFICANT. Construction of the proposed Potrero 230 kV Switchyard and GIS structure would modify the visual setting of the former Potrero Power Plant by introducing a new industrial building to the west of and approximately adjacent to a multi-story brick industrial building within the former power plant site (Station A) and by removing or modifying the existing brick wall that fronts Station A. It would also result in the removal of foundations from other structures at Station A that have been demolished in the past. The proposed building, while altering the setting of Station A, would 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 would document and record the setting of Station A and its few remaining buildings, and APM CUL-8 would require treatment of the brick wall modifications according to the Secretary of the Interior Standards for the Treatment of Historic Properties, resulting in a less than significant change. Therefore, the construction of the proposed Potrero 230 kV Switchyard and GIS building, while altering the existing setting of Station A, would not result in a substantial adverse effect.

Excavation of a 10-foot-deep foundation for the proposed switchyard may create ground-borne vibration that could affect the structural integrity of Station A and the remaining brick building. Section 5.12, Noise, discusses construction-related vibration and the potential for vibration during construction to cause structural damage. Distance attenuates the effects of construction-related ground-borne vibration so that only the immediate area around the activity (within about 50 feet) would be impacted. Construction of the proposed Potrero 230 kV Switchyard would be sufficiently distant from these structures that damage would be unlikely. As previously noted, APM-CUL-7 and APM CUL-8 require PG&E to document and record the setting of Station A. Additionally implementation of APM CUL-1 and APM CUL-6 would include training and monitoring to avoid potential damage and 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 §15064.5?

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED. 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. APM CUL-1 through APM 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. However, mitigation is recommended to supersede APM CUL-4. Mitigation Measure C-1 (Unanticipated discoveries of cultural deposits) would be necessary to ensure that a CPUC-approved cultural resources specialist provides oversight and evaluation of any unanticipated discoveries and that the preferred method of mitigation is preservation in place. Similarly, to clarify the procedures for avoiding known and potential shipwrecks, identified by side scan sonar and magnetometer surveys conducted for the Proposed Project (see Marine Geophysical Survey Results), Mitigation Measure C-2 (Avoid known and potential shipwreck locations) would be necessary to supplement APM CUL-2. Implementation of the APMs and Mitigation Measures C-1 and C-2 would ensure a less-than-significant impact during project construction.

Mitigation Measure for Preservation of Unanticipated Discoveries

MM C-1 **Unanticipated discoveries of cultural deposits.** This mitigation supersedes APM CUL-4. 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. The CPUC-approved cultural resources specialist shall be contacted immediately to examine the discovery and determine if further investigation 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 subject to further impact, the CPUC-approved cultural resource specialist/archaeologist shall evaluate the resource and determine whether it is: (1) eligible for the CRHR (and thus a historical resource for purposes of CEQA); or (2) a unique archaeological resource as defined by CEQA. If the resource is determined to be neither a unique archaeological nor an historical resource, work may commence in the area. If the resource meets the criteria for either an historical or unique archaeological resource, or both, work shall remain halted, and the cultural resources specialist/archaeologist shall consult with CPUC staff regarding methods to ensure that no substantial adverse change would occur to the significance of the resource pursuant to CEQA Guidelines Section 15064.5(b).

Preservation in place, i.e., avoidance, is the preferred method of mitigation for impacts to historical or unique archaeological resources. Alternative methods of treatment that may be demonstrated by the CPUC to be effective include evaluation, collection, recordation, and analysis of any significant cultural materials in accordance with a Cultural Resources Management Plan prepared by the CPUC approved qualified cultural resource specialist/archaeologist. The methods and results of evaluation or data recovery work at an archaeological find shall be documented in a professional level technical report to be filed with CHRIS. Work may commence upon completion of treatment, as approved by the CPUC.

Mitigation Measure to Avoid Known and Potential Cultural Resources

MM C-2 **Avoid known and potential shipwreck locations.** This measure incorporates and supplements portions of APM CUL-2, Resource Avoidance. During installation of the submarine cable, PG&E and its contractors shall map the as-built alignment of the cable in relation to known cultural resources, and the contractors shall ensure that the cable passes at least 100 feet to the west of the known shipwreck located in the northeastern portion of the marine geophysical survey area and mapped on NOAA Chart no.18650. In addition, prior to the installation of the cable, PG&E and its contractors shall map a 50 foot buffer around the magnetic anomaly identified by OSI as anomaly no. M63 in the southern half of the marine geophysical survey area and located at 6019099E, 2106491N, as the anomaly may result from the remains of a shipwreck buried beneath the bay floor in that location. PG&E and its contractors shall ensure that no sediment disturbing excavation or hydroplowing is conducted within the 50 foot buffer zone. If the project cannot be routed around the anomaly, additional evaluation and mitigation as detailed in Mitigation Measure C-1, for unanticipated discoveries, and detailed in the Unanticipated Discoveries Plan may be necessary prior to excavation.

c. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

LESS THAN SIGNIFICANT. The project would 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 possess 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 would require trenching through artificial fill and potentially some low-sensitivity Holocene Bay Mud. The northern HDD would 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 would be located in sand or Bay Mud. The southern end of the project alignment would likely affect Mesozoic serpentinite and artificial fill along the onshore 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 would involve three small-diameter (12-inch) HDD borings. If the three HDD borings enter the Colma Formation, it is possible that paleontological resources would be impacted. However, given the moderate sensitivity of the Colma Formation and the limited effects of the 12-inch borings, no significant impact to paleontological resources would occur.

Drilling activities within the moderate sensitivity Colma Formation and low-sensitivity Franciscan Complex and Bay Mud geology would be unlikely to impact scientifically important paleontological resources. However, in the unlikely event that a previously unidentified paleontological resource is uncovered during implementation of the project, the impact to paleontological resources resulting from this project would be less than significant with implementation of the APMs PR-1 and PR-2.

d. Would the project disturb any human remains, including those interred outside of formal cemeteries?

NO IMPACT. The Proposed Project would not impact any formal cemeteries. Project impacts to human remains are not anticipated. If human remains are discovered, PG&E would implement APM CUL-5; therefore, no impacts are expected.

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5.6 Geology and Soils

GEOLOGY AND SOILS Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	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 groundshaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. Be located on geologic units 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 1803.5.3 of the California Building Code (2010), creating substantial risks to life or property?	☐	☐	☐	☒
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G. Question (d) reflects the current 2010 California Building Code (CBC), effective January 1, 2011, which is based on the International Building Code (2009).

5.6.1 Setting

This section describes geology, soils, seismic, and mineral resource conditions and analyzes environmental impacts related to geologic and seismic hazards that are expected to result from the implementation of the Proposed Project. The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts, and recommends measures to reduce or avoid adverse impacts anticipated from Project construction and operation. In addition, existing laws and regulations relevant to geologic and seismic hazards are described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Project.

Baseline geologic, seismic, and soils information were collected from published and unpublished literature, GIS data, and online sources for the Proposed Project and the surrounding area. Data sources included the following: the Proponent’s Environmental Assessment (PG&E, 2012a), geologic literature from the U.S. Geological Survey (USGS) and California Geological Survey, geologic and soils GIS data, and online reference materials. The study area was defined as the locations of project components and the areas of San Francisco and the bay immediately adjacent to the Proposed Project for most geologic and soils issue areas with the following exception: the study area related to seismically induced ground shaking includes significant regional active and potentially active faults within 50 miles of the Proposed Project.

Regional Geologic Setting

The Embarcadero-Potrero project area is located in the western portion of the Coast Ranges Geomorphic Province of California. Past episodes of tectonism have folded and faulted the rock of the Coast Ranges creating the regional topography of northwest-trending ridges and valleys that is characteristic of this province. The San Francisco Bay and other local topographic depressions have been subsequently filled with various marine, estuarine, alluvial, and wind-blown sediments. Basement rock in the region is comprised of Franciscan Complex rocks of Jurassic and Cretaceous age that form the bedrock both east and west of the San Andreas fault on the San Francisco Peninsula. The Franciscan Complex consists of an intermixed assemblage of volcanic, sedimentary and low grade metamorphic rocks that accumulated along and were subsequently highly deformed in the boundary between two converging tectonic plates.

Local Geology

The onshore segments of the Proposed Project are located within the former Mission Bay area of eastern San Francisco. The Mission Bay area historically was a small embayment of the San Francisco Bay consisting of shallow water, tidal flats, and marshland. Placement of artificial fill with the Mission Bay area began in the late 1800's and continued into the early 20th century. Some of the central portions of Mission Bay reportedly were filled with debris from the City following the 1906 earthquake and fire. As part of PG&E's Feasibility Study for the Proposed Project, AMEC prepared a geotechnical evaluation report for the onshore segments of the Project which included review of existing borings and conducting field exploration (AMEC, 2012). Review of the local geologic maps (USGS, 2000a and 2000b) and AMEC's report indicate that the subsurface geologic units beneath the onshore project components include three primary geologic units, as shown in Figure 5.6-1, Geologic Map. The offshore portion of the Proposed Project is entirely underlain by Bay Mud. The HDD transitional portion of the alignments would pass through Bay Mud, older alluvial sediments beneath the Bay Mud, and artificial fill as they transition onto land. The geologic units are described below, in general order of youngest to oldest.

Artificial Fill. Artificial fill is found along both the northern and southern segments of the onshore alignment. Thickness of the fill is expected to range from 10 to about 25 feet (AMEC, 2012). Due to the age and undocumented nature of much of the artificial fill in the Mission Bay area, the characteristics and distribution of it is likely to vary along the segment alignments. Generally the artificial fill is comprised varying amounts of sand, clay, and gravel, with local areas of man-made debris such as lumber, concrete and brick fragments, and industrial slag materials. Consistency of the clays range from soft to very stiff, and density of the sands range from very loose to medium dense (AMEC, 2012). Serpentinite gravel in the fill is likely sourced from the nearby and underlying Franciscan Complex bedrock.

Dune Sand. A small portion of the northern onshore segment is underlain by Quaternary aeolian deposits, Dune Sands, with thickness ranging from 0 to 20 feet near the alignment (AMEC, 2012). The Dune Sand deposits generally comprised of light gray to light brown, fine to medium grained, loose to medium dense sand.

Young Bay Mud. Holocene (Young) Bay Mud deposits may be encountered during trenching for the transmission line in areas of thin artificial fill and will be encountered by the HDD transitional borings. Young Bay Mud ranges in thickness from 0 to about 110 feet and typically consists of organic-rich, compressible silts and clays deposited within the bay basin and along the margins of the basin and along its margins as mud or tidal flats. The silts and clays of the Young Bay Mud are high plasticity, very soft to soft clay and silt, with local lenses of sand, shells, and peat. It is typically dark gray to dark greenish gray, and commonly has layers with abundant organic debris such as leafs, wood fragments, rootlets, and shell fragments.

Young Bay Mud within 10 to 20 feet below the San Francisco Bay floor in the vicinity of the offshore segment of the Proposed Project generally shows horizontal sediment layers characteristic of inter-bedded silt and clay deposits with some sand and is expected to be soft to very soft (B&V, 2012).

Older Alluvial Sediments. Older alluvial deposits are found beneath the Young Bay Mud and vary in thickness. The older alluvial sediments are typically composed of interbedded layers of sand and clay with varying amounts of sand, silt, and clay. The sand layers are generally dense to very dense and the clays are very stiff. Colors are typically olive and olive brown, but also include brown, dark gray, and greenish gray (B&V, 2012).

Franciscan Complex Bedrock. Serpentinite is mapped along southern onshore segment of the Proposed Project and near to the northern onshore segment. Serpentinite is expected to be encountered at the surface along the southern onshore segment; serpentinite at and near the surface is commonly. Serpentinite is encountered within a foot of the ground surface in the northeastern portion of project area near Embarcadero Substation (B&V, 2012), and is expected to be encountered fairly shallowly beneath the artificial fill along portions of the northern onshore segment. The degree of weathering ranges from severe to locally fresh and resistant. The severely weathered rock is generally soft and weathered to clay, and the fresh and resistant rock is generally hard with little clay development. The serpentinite is usually light olive gray, olive gray, and grayish green (B&V, 2012).

Soils

Soils within the Proposed Project area reflect the underlying rock type, the extent of weathering of the rock, the degree of slope, and the degree of human modification. Expansive soils are characterized by their ability to undergo significant volume change (shrink and swell) due to variations in soil moisture content. Changes in soil moisture can result from rainfall, landscape irrigation, utility leakage, roof drainage, and/or perched groundwater. Expansive soils are typically very fine grained with a high to very high percentage of clay.

Based on the NRCS Web Soil Survey the soil units underlying proposed onshore project components are mapped as Urban land and Urban land-Orthents, reclaimed complex (NRCS, 2013). These areas are almost completely covered by concrete, asphalt and other urban structures or are primarily made up of fill of varying compositions. These areas have very little to no data associated with them in the NRCS databases.

An evaluation of borings logs and CPT soundings prepared for this and previous investigations conducted by AMEC (2012) indicates that the fill sediments underlying the onshore portion of the project are primarily comprised of granular sediments ranging from sand to sandy silt. These granular soils are not expected to exhibit any shrink swell behavior.

Slope Stability

Important factors that affect the slope stability of an area include the steepness of the slope, the relative strength of the underlying rock material, and the thickness and cohesion of the overlying colluvium and alluvium. The steeper the slope and/or the less strong the rock, the more likely the area is susceptible to landslides. The steeper the slope and the thicker the colluvium, the more likely the area is susceptible to debris flows. Another indication of unstable slopes is the presence of old or recent landslides or debris flows.

The project alignment traverses flat to relatively flat topography and no known landslides occur in the immediate project vicinity, therefore landslides and other slope failures would not occur.

Seismicity

The San Francisco Bay Area is in a seismically active region near the boundary between two major tectonic plates, the Pacific Plate to the southwest and the North American Plate to the northeast. The relative movement between the Pacific Plate and the North American Plate generally occurs across a 50-mile zone extending from the San Gregorio fault in the southwest to the Great Valley Thrust Belt to the northeast. Strain produced by the relative motions of these plates is relieved by right lateral strike slip faulting on the San Andreas Fault Zone and related faults (San Gregorio, Calaveras, Hayward), and by vertical reverse slip displacement on the Great Valley and other thrust faults in the central California area.

Strong ground shaking at the project sites could occur as a result of an earthquake on any one of the active regional faults shown in Figure 5.6-2, Regional Active Fault Map. The San Andreas fault, the dominant tectonic feature of the San Francisco Peninsula, is the primary structure within the broad transform boundary that accommodates right lateral motion between the North American and Pacific tectonic plates. Movement of these plates is primarily translated in the Bay Area as right lateral slip along the San Andreas Fault Zone. The USGS Working Group on California Earthquake Probabilities concluded that there is a 62 percent probability of a strong earthquake (Magnitude $M \geq 6.7$) occurring in the San Francisco Bay Region in a thirty year period between 2003 and 2032 (WGCEP, 2003). Additionally the 2007 Working Group on California Earthquake Probabilities (WGCEP, 2008) has concluded that within the next 30 years the probability of a strong earthquake ($M \geq 6.7$) occurring on regional faults is as follows: 21 percent for the Northern San Andreas Fault Zone, 31 percent for the Hayward-Rodgers Creek Fault Zone, and 6 percent for the San Gregorio Fault.

The San Francisco Bay Area is characterized by numerous geologically young right-lateral strike slip and normal-right oblique slip faults due to this combination of translational and extensional stress. These faults can be classified as historically active, active, potentially active, or inactive, based on the following criteria (CGS, 1999):

- Faults that have generated earthquakes accompanied by surface rupture during historic time (approximately the last 200 years) and faults that exhibit aseismic fault creep are defined as Historically Active.
- Faults that show geologic evidence of movement within Holocene time (approximately the last 11,000 years) are defined as Active.
- Faults that show geologic evidence of movement during the Quaternary time (approximately the last 1.6 million years) are defined as Potentially Active.
- Faults that show direct geologic evidence of inactivity during all of Quaternary time or longer are classified as Inactive.

Although it is difficult to quantify the probability that an earthquake will occur on a specific fault, this classification is based on the assumption that if a fault has moved during the Holocene epoch, it is likely to produce earthquakes in the future. Since periodic earthquakes accompanied by surface displacement can be expected to continue in the study area through the lifetime of the Proposed Project, the effects of strong groundshaking and fault rupture are of primary concern to safe operation of the project components.

The nearest fault to the project site is the northern segment of the San Andreas Fault, passing about 7.5 miles to the west of the Proposed Project. Active and potentially active faults within 50 miles of the Project alignments that are significant potential seismic sources relative to the Proposed Project are presented in Table 5.6-1.

Table 5.6-1. Significant Active and Potentially Active Faults within 50 miles of the Proposed Project

Fault Name	Closest Distance[a] (miles)	Closest Project Component(s)	Estimated Maximum Magnitude[b]
San Andreas (Peninsula)	7.5	Southern Onshore Segment & Potrero Switchyard	7.2 to 7.8
Hayward-Rodgers Creek	9.6	Offshore Segment	6.6 to 7.3
San Gregorio	11.6	Southern Onshore Segment & Potrero Switchyard	7.5
Mount Diablo Thrust	19.9	Offshore Segment	6.7
Calaveras	20.3	Offshore Segment	6.3 to 7.0
Concord	22.7	Offshore Segment	6.2
Green Valley	23.0	Northern Onshore Segment and Offshore Segment	6.8
Monte-Vista Shannon	23.2	Southern Onshore Segment & Potrero Switchyard	6.5
West Napa	27.0	Northern Onshore Segment	6.7
Greenville	30.8	Offshore Segment	7.0
Great Valley 5	33.6	Northern Onshore Segment	6.7
Great Valley 4	41.9	Northern Onshore Segment	6.8
Great Valley 7	47.1	Southern Onshore Segment	6.9

[a] Fault distances obtained from USGS GIS Quaternary fault data (USGS and CGS, 2006) and 2008 National Seismic Hazard Maps – Fault Parameters website (USGS, 2013).
[b] Maximum Earthquake Magnitude – the maximum earthquake that appears capable of occurring under the presently known tectonic framework, magnitude listed is "Ellsworth-B" magnitude from USGS OF08-1128 (Documentation for the 2008 Update of the U.S. National Seismic Hazard Maps) unless otherwise noted. Magnitude varies by rupture strategy, one or several segments of the fault rupturing in the same event.

Since periodic earthquakes accompanied by surface displacement can be expected to continue in the study area through the lifetime of the Proposed Project, the effects of strong groundshaking and fault rupture are of primary concern to safe operation of the project components.

Fault Rupture

Fault rupture is the surface displacement that occurs when movement on a fault deep within the earth breaks through to the surface. Fault rupture and displacement almost always follows preexisting faults, which are zones of weakness, however not all earthquakes result in surface rupture (i.e., earthquakes that occur on blind thrusts do not result in surface fault rupture). Rupture may occur suddenly during an earthquake or slowly in the form of fault creep. In addition to damage caused by ground shaking from an earthquake, fault rupture is damaging to buildings and other structures due to the differential displacement and deformation of the ground surface that occurs from the fault offset leading to damage or collapse of structures across this zone.

While the closest fault to the project site is the active San Andreas fault, no known active or potentially active faults are mapped crossing or immediately adjacent to any project components. Therefore there is no potential for primary fault rupture to impact the project site.

Ground Shaking

An earthquake is classified by the amount of energy released, which traditionally has been quantified using the Richter scale. Recently, seismologists have begun using a Moment Magnitude (M) scale because it provides a more accurate measurement of the size of major and great earthquakes. For earthquakes of less than M 7.0, the Moment and Richter Magnitude scales are nearly identical. For earthquake magnitudes greater than M 7.0, readings on the Moment Magnitude scale are slightly greater than a corresponding Richter Magnitude.

The intensity of the seismic shaking, or strong ground motion, during an earthquake is dependent on the distance between the Project area and the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the Project area. Earthquakes occurring on faults closest to the Project area would most likely generate the largest ground motion. The intensity of earthquake induced ground motions can be described using peak site accelerations, represented as a fraction of the acceleration of gravity (g). The USGS National Seismic Hazard (NSH) Maps were used to estimate approximate peak ground accelerations (PGAs) in the Proposed Project area. The NSH Maps depict peak ground accelerations with a 2 percent probability of exceedance in 50 years which corresponds to a return interval of 2,475 years and for a maximum considered earthquake. The estimated approximate peak ground acceleration from large earthquakes for the project area is 0.70 g, which corresponds to strong ground shaking.

A review of historic earthquake activity from 1800 to 2012 indicates that many earthquakes of M 6.0 or greater have occurred within 50 miles of the project route (NEIC, 2012). A summary of significant damaging earthquake events in the San Francisco Bay Area is presented in Table 5.6-2.

Table 5.6-2. Significant Historic Earthquakes

Date	Magnitude	Name, Location, or Region Affected	Associated Fault	Comments[a]
June 1838	Assumed between 6.8 and 7.4	San Francisco area	San Andreas	This earthquake is associated with probable rupture of the San Andreas fault from Santa Clara to San Francisco (approximately 37 miles). Walls were cracked at Mission Dolores and in Monterey.
October 8, 1865	6.5	Santa Cruz Mountains	San Andreas	Caused severe damage in New Almaden, Petaluma, San Francisco, San Jose, Santa Clara, and Santa Cruz resulting in $500,000 in property damage. Ground cracks, heaving, and subsidence were noted in several areas.
October 21, 1868	7.0	Hayward	Hayward	Felt throughout northern California and Nevada. Resulted in 30 deaths and $300,000 in property damage. Occurred on the Hayward fault with rupture from Berkeley to Fremont. Caused severe damage in the East Bay and San Francisco.
June 20, 1897	6.2	Gilroy	Calaveras	Felt from Woodland to San Luis Obispo. Resulted in building collapse in the Santa Clara Valley. Fissures were noted on the Calaveras fault south-east of Gilroy.
April 18, 1906	7.8	San Francisco Earthquake, San Francisco	San Andreas	This earthquake and the resulting fires caused approximately 3,000 deaths and $524 million in damage ($24 million from the earthquake alone). Destruction from this earthquake occurred at distances of up to 350 miles from the epicenter.
July 1, 1911	6.4	Morgan Hill	Calaveras	Located on the Calaveras fault, caused substantial damage in Gilroy and the Santa Clara Valley. Felt as far away as Reno, Nevada.

Table 5.6-2. Significant Historic Earthquakes

Date	Magnitude	Name, Location, or Region Affected	Associated Fault	Comments[a]
January 24, 1980	5.8	North of Livermore Valley	Greenville	Occurred on the Greenville fault with surface rupture of approximately nine miles. Resulted in numerous injuries and $11.5 million in property damage (primarily at Lawrence Livermore Laboratory).
April 24, 1984	6.2	Morgan Hill Earthquake, Morgan Hill	Calaveras	Earthquake was felt from San Francisco to Bakersfield and was located near the epicenter of the 1911 earthquake in Morgan Hill. Resulted in injuries and approximately $8 million in property damage.
October 17, 1989	6.9	Loma Prieta Earthquake, Santa Cruz Mountains	San Andreas	Largest earthquake to occur on the San Andreas fault since 1906. Resulted in 63 deaths, over 3,000 injuries, and an estimated $6 billion in property damage. Severe damage occurred from San Francisco to Monterey and in the East Bay, and included damage and destruction of buildings, roads, bridges, and freeways.

a. Earthquake damage information primarily compiled from the National Earthquake Information Center and the Berkeley Seismological Laboratory websites. Estimates of property damage values are in dollars valued to the year of damage.

Liquefaction

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced strong ground shaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude and frequency of earthquakes in the surrounding region. Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects (Youd and Perkins, 1978). In addition, densification of the soil resulting in vertical settlement of the ground can also occur. In order to determine liquefaction susceptibility of a region, three major factors must be analyzed. These include: (a) the density and textural characteristics of the alluvial sediments; (b) the intensity and duration of ground shaking; and (c) the depth to groundwater.

According to the California Geological Survey (CGS) Seismic Hazard map for the City and County of San Francisco (CGS, 2001), a large portion of the onshore project area is located within a mapped area of potential liquefaction hazard zone as shown in Figure 5.6-3, Seismic Hazard Map. Along the onshore project alignments, groundwater levels are expected to be shallow; varying from 5 to 15 feet in depth with some seasonal variation (AMEC, 2012) and granular layers in the artificial fill underlying large portions of the project would be subject to earthquake induced liquefaction. The undocumented artificial fill placed on the bay margins are highly prone to liquefaction. Saturated granular layers with the artificial fills consisting of sands or silty sands would be highly susceptible to liquefaction. In addition, sand lenses within the Young Bay Mud deposits may also be susceptible to liquefaction. AMEC conducted a liquefaction analyses that indicated that in the Mission Bay area, liquefaction-induced settlement is likely to be in the range 6 to 12 inches, with an upper bound on the order of 18 inches.

The offshore segment of the route is not liquefaction prone due to the fine grained nature of the Young Bay Mud sediments. Liquefaction analysis conducted for PG&E's Feasibility Study indicated up to an inch or two of settlement associated with liquefaction induced volumetric compaction and up to several tens of inches of lateral seismic deformation may be possible (B&V, 2012).

Based on the history of liquefaction induced lateral spreading that occurred in the general project area in past earthquakes and the available subsurface data, AMEC estimated that in the near-shore areas where fill overlies Young Bay Mud the likely lateral spreading would be in the range of 0.5 to 3 feet, with an upper bound on the order of 6 feet (AMEC, 2012).

Applicable Standards and Regulations

Federal. The Clean Water Act establishes the basic structure for regulating discharges of pollutants into the Waters of the U.S. The Act authorized the Public Health Service to prepare comprehensive programs for eliminating or reducing the pollution of interstate waters and tributaries and improving the sanitary condition of surface and underground waters with the goal of improvements to and conservation of waters for public water supplies, propagation of fish and aquatic life, recreational purposes, and agricultural and industrial uses. The Proposed Project construction would disturb a surface area greater than one acre; therefore, SCE would be required to obtain under Clean Water Act regulations a National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity. Compliance with the NPDES would require that the applicant submit a Storm Water Pollution Prevention Plan (SWPPP).

The International Building Code (IBC) is published by the International Code Council (ICC), the scope of this code covers major aspects of construction and design of structures and buildings, except for three-story one- and two-family dwellings and town homes. The International Building Code has replaced the Uniform Building Code as the basis for the California Building Code and contains provisions for structural engineering design. The 2009 IBC addresses the design and installation of structures and building systems through requirements that emphasize performance. The IBC includes codes governing structural as well as fire- and life-safety provisions covering seismic, wind, accessibility, egress, occupancy, and roofs.

The Institute of Electrical and Electronics Engineers (IEEE) 693 “Recommended Practices for Seismic Design of Substations” was developed by the Substations Committee of the IEEE Power Engineering Society, and approved by the American National Standards Institute and the IEEE-SA Standards Board. This document provides seismic design recommendations for substations and equipment consisting of seismic criteria, qualification methods and levels, structural capacities, performance requirements for equipment operation, installation methods, and documentation. This recommended practice emphasizes the qualification of electrical equipment. IEEE 693 is intended to establish standard methods of providing and validating the seismic withstand capability of electrical substation equipment. It provides detailed test and analysis methods for each type of major equipment or component found in electrical substations. This recommended practice is intended to assist the substation user or operator in providing substation equipment that will have a high probability of withstanding seismic events to predefined ground acceleration levels. It establishes standard methods of verifying seismic withstand capability, which gives the substation designer the ability to select equipment from various manufacturers, knowing that the seismic withstand rating of each manufacturer's equipment is an equivalent measure. Although most damaging seismic activity occurs in limited areas, many additional areas could experience an earthquake with forces capable of causing great damage. This recommended practice should be used in all areas that may experience earthquakes.

State. The California Building Code, Title 24, Part 2 (CBC, 2010) provides building codes and standards for design and construction of structures in California. The 2010 CBC is based on the 2009 International Building Code with the addition of more extensive structural seismic provisions. As the Proposed Project lies within Seismic Zone 4, provisions for design should follow the requirements of Chapter 16 of the CBC, which contains definitions of seismic sources and the procedure used to calculate seismic forces on structures.

The Alquist-Priolo Earthquake Fault Zoning Act of 1972, Public Resources Code (PRC), sections 2621–2630 (formerly the Special Studies Zoning Act) regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. While this act does not specifically regulate transmission and telecommunication lines; it does help define areas where fault rupture is most likely to occur. This Act groups faults into categories of active, potentially active, and inactive. Historic and Holocene age faults are considered active, Late Quaternary and Quaternary age faults are considered potentially active, and pre-Quaternary age faults are considered inactive. These classifications are qualified by the conditions that a fault must be shown to be “sufficiently active” and “well defined” by detailed site-specific geologic explorations in order to determine whether building setbacks should be established.

The Seismic Hazards Mapping Act (the Act) of 1990 (Public Resources Code, Chapter7.8, Division 2, sections 2690–2699.) directs the California Department of Conservation, Division of Mines and Geology [now called California Geological Survey (CGS)] to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards. Cities, counties, and State agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes. The Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.

CPUC General Order 128 (Rules for Construction of Underground Electric Supply and Communication Systems) contains State of California rules formulated to provide uniform requirements for underground electrical supply and communication systems, to insure adequate service and secure safety to persons engaged in the construction, maintenance, operation or use of underground electrical supply and communication systems and to the public. General Order 128 is not intended as complete construction specification, but to embody requirements which are most important from the standpoint of safety and service. Construction shall be according to accepted good practice for the given local conditions in all particulars not specified in the rules. General Order 128 applies to (a) all underground electrical supply systems used in connection with public utility service; when located in buildings, the vaults, conduit, pull boxes or other enclosures for such systems shall also meet the requirements of any statutes, regulations or local ordinances applicable to such enclosures in buildings; and (b) all underground communication systems used in connection with public utility service located outside of buildings. General Order 128 applies to the following activities related to underground electrical supply and communication systems: Construction and Reconstruction of Lines, and Maintenance.

Local. The San Francisco General Plan Community Safety 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).

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study (see Table 5.6-3).

Table 5.6-3. Applicant Proposed Measures (APMs) Related Geology and Soils

APM Number	Issue Area
	Geology and Soils
APM 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).

Table 5.6-3. Applicant Proposed Measures (APMs) Related Geology and Soils

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. 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 PEA 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.

5.6.2 Environmental Impacts and Mitigation Measures

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? Refer to Division of Mines and Geology Special Publication 42.

NO IMPACT. No known faults are located in a manner that would cross the proposed transmission line or other facilities or would be immediately adjacent to it. Therefore, there is no potential for primary fault rupture to impact the project.

ii) Strong seismic ground shaking?

LESS THAN SIGNIFICANT. The Proposed Project would be located in an area mapped as likely to experience strong ground shaking in the event of a large earthquake with PGA's of 0.70 or a 2 percent probability of exceedance in 50 years. The area has historically experienced moderate to severe groundshaking due to the numerous earthquakes that have occurred in the San Francisco Bay Area, as shown in Table 5.6-2. These earthquakes have resulted in severe damage to structures, millions of dollars in property damage, and deaths. Although the Proposed Project would be located in an area that may experience strong groundshaking due to large local or regional earthquakes, the new Potrero 230 kV Switchyard would be designed as required by CPUC General Order 131-D (Planning and construction of facilities for the generation of electricity and certain electric transmission facilities), and the 230 kV transmission line and associated structures would be designed as required by CPUC General Order 128 (Rules for Construction of Underground Electric Supply and Communication Systems). Current standard design practices for substation and similar facilities also would include design recommendations in the Institute of Electrical and Electronic Engineers guidelines IEEE 693 (Recommended Practices for Seismic Design of Substations). Design of these new facilities and structures to the above referenced guidelines and standards would reduce the impact of any potential damage from groundshaking to these features. Additionally APM GS-2, which requires site specific seismic analysis and design based on current seismic design practices and guidelines, would be implemented. Application of the above mentioned requirements and implementation of APM GS-2 would reduce the impact from earthquake induced ground shaking to a less than significant level.

iii) Seismic-related ground failure, including liquefaction?

LESS THAN SIGNIFICANT. Strong groundshaking could result in liquefaction-related phenomena along sections of the proposed underlain by artificial fill and Young Bay Mud with potentially liquefiable granular layers. Portions of the proposed onshore transmission line would be within a CGS mapped liquefaction hazard zone as shown in Figure 5.6-3. Based on analyses and evaluation conducted by AMEC for the project, liquefaction induced settlement in the range of 6 to 12 inches and liquefaction induced lateral spreading of 0.5 to 3 feet could be triggered by a large regional earthquake. The proposed offshore segment of the route would be underlain by fine grained Young Bay Mud and not likely to liquefy. However, analysis conducted for PG&E's Feasibility Study indicated that up to an inch or two of settlement associated with liquefaction induced volumetric compaction and up to several tens of inches of lateral seismic deformation may be possible (B&V, 2012). Implementation of APM GS-1 (Appropriate soil stability design measures implementation) and APM GS-2 (Appropriate seismic safety design measures implementation) would reduce the potential for liquefaction related phenomena to damage project components, and with these measures, the impact related to seismic related ground failure, including liquefaction, would be less than significant.

iv) Landslides?

NO IMPACT. The Proposed Project would be built in an area that is flat to gently sloping and offshore. As a result, there would be no potential for landslides to impact project components.

b. Would the project result in substantial soil erosion or the loss of topsoil?

LESS THAN SIGNIFICANT. Significant ground disturbing activities which could result in erosion would occur during construction of the onshore sections of the proposed transmission line and switchyard. Ground disturbance would occur for: trenching and excavation for the underground sections connecting to Potrero Switchyard and Embarcadero Substation, horizontal directional drilling (HDD) at the two transitions from land to the submarine alignment, excavation for the HDD entry pits and splice vaults, and grading and excavation for construction of the new Potrero 230 kV Switchyard near the existing Potrero 115 kV Switchyard. Implementation of appropriate erosion control BMPs would occur as required by APM GS-3 (Appropriate erosion-control measures implementation), and this measure would reduce the potential impact related to soil erosion to a less than significant level.

c. Would the project be located on geologic units 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. As discussed above for Item (a)[iii – Seismic related ground failure], portions of the Proposed Project would introduce new project facilities and structures in areas with potentially liquefiable artificial fill and Young Bay Mud sediments (Figure 5.6-3), and these project components could potentially suffer liquefaction related damage. As discussed under Item (a), implementation of APM GS-1 and APM GS-2 would reduce this potential impact to a less than significant level.

d. Would the project be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2010), creating substantial risks to life or property?

NO IMPACT. Based on the geologic and soils units underlying the proposed onshore project components, expansive soils are not expected to occur. Therefore, there would be no impact.

e. Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

NO IMPACT. The project would not include any components requiring septic tanks or alternative wastewater systems. Therefore, there would be no impact.

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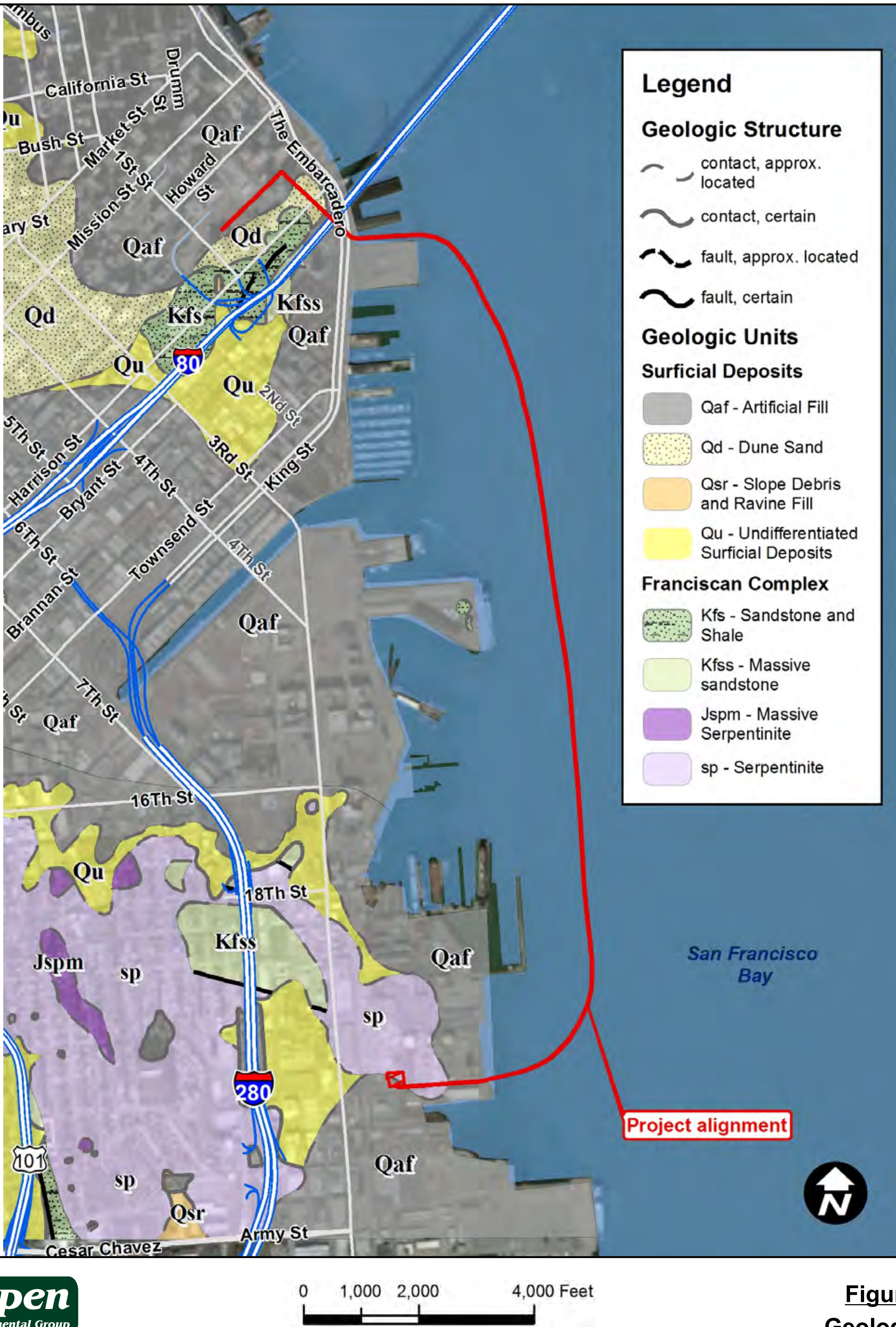

Aspen Environmental Group

Source: Aspen, 2013.

Figure 5.6-1
Geologic Map

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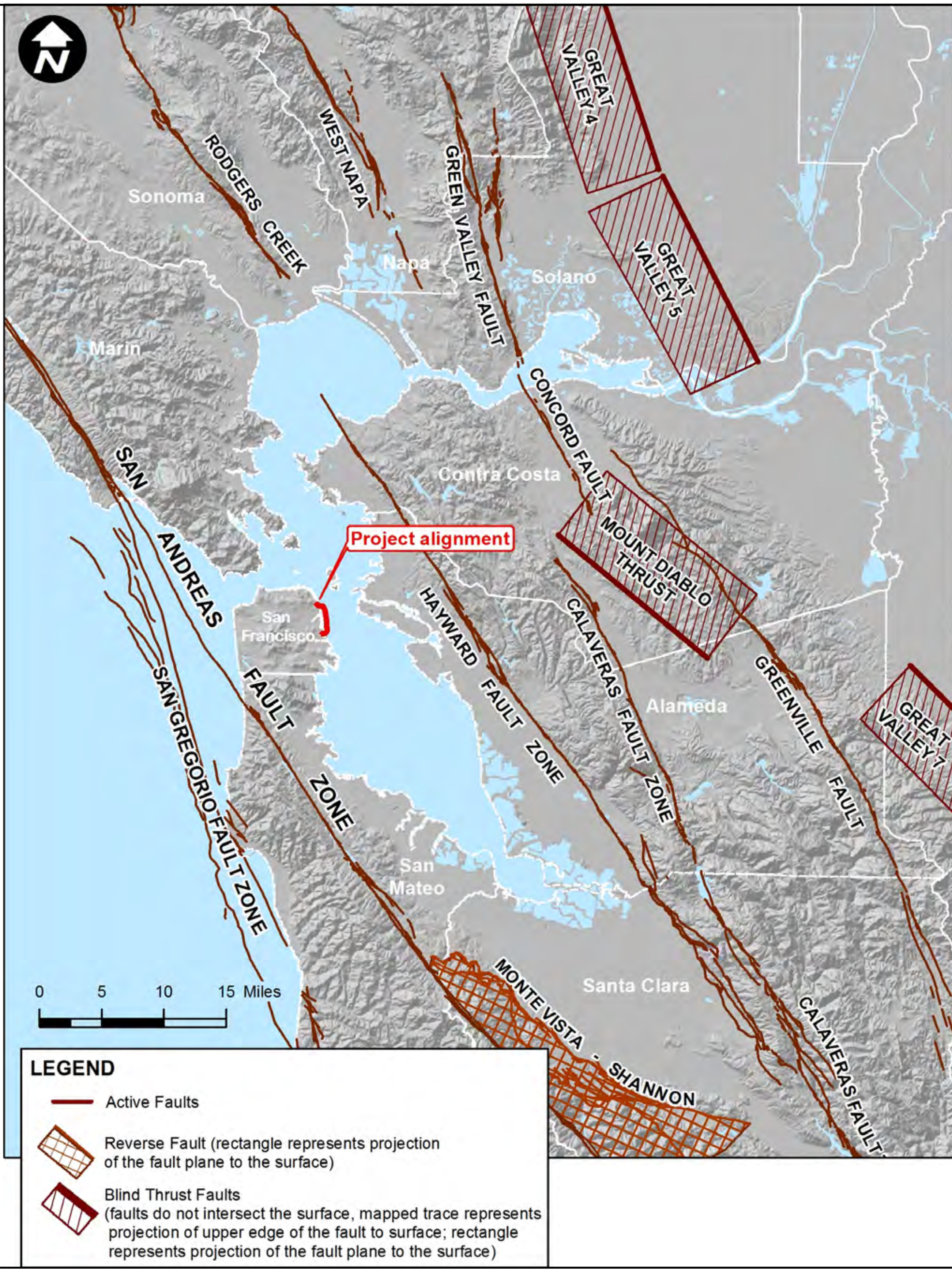

Aspen Environmental Group

Source: Aspen, 2013.

Figure 5.6-2

Regional Active Fault Map

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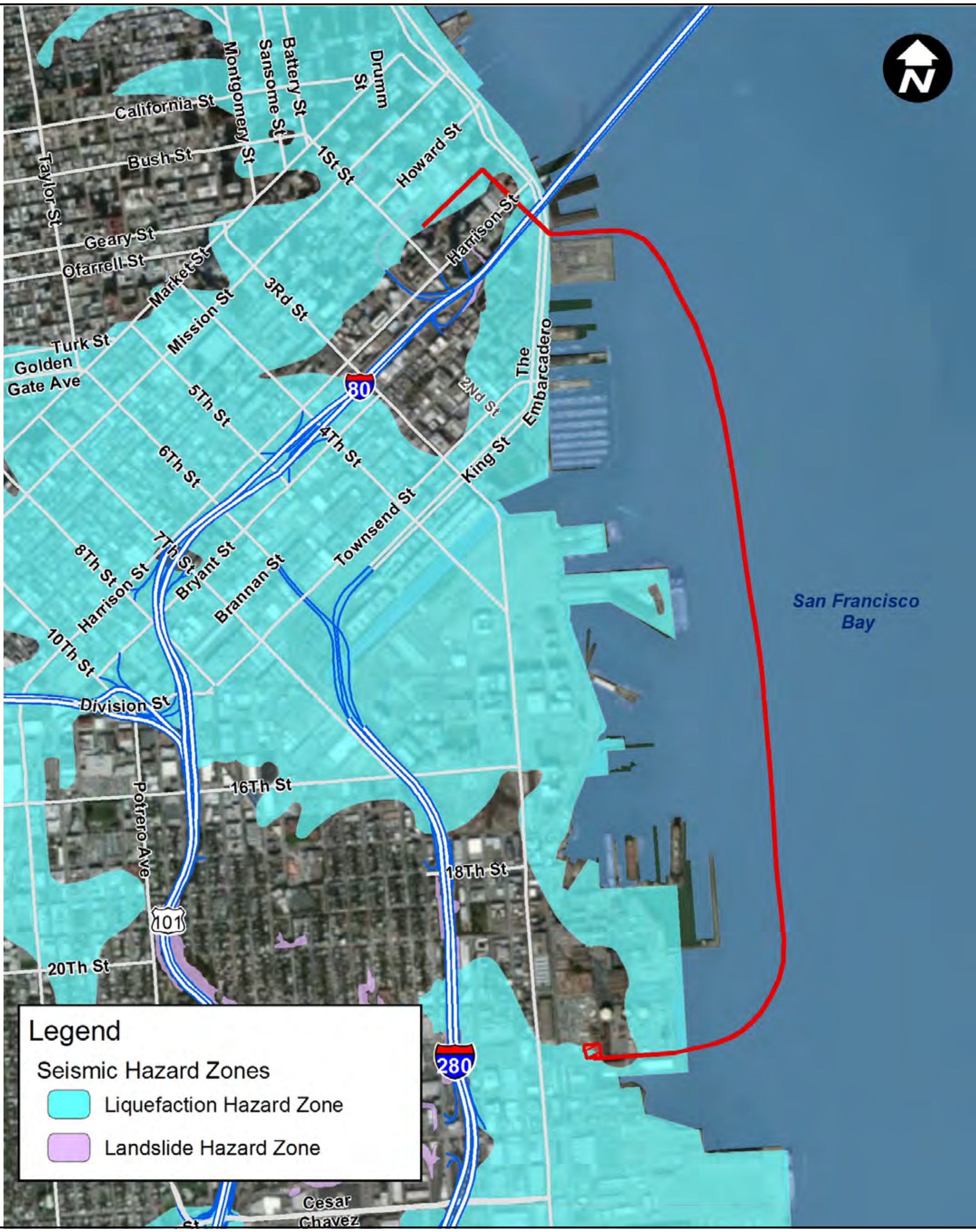

0 1,500 3,000 6,000 Feet

Aspen Environmental Group

Source: Aspen, 2013.

Figure 5.6-3
Seismic Hazard Map

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5.7 Greenhouse Gas Emissions

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 adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Significance criteria established by CEQA Guidelines, Appendix G.

5.7.1 Setting

Globally, temperature, precipitation, sea level, ocean currents, wind patterns, and storm activity are all affected by the presence of greenhouse gases (GHG) in the atmosphere. In contrast to air quality that is of regional or local concern, human-caused emissions of GHGs are linked to climate change on a global scale. GHGs allow ultraviolet radiation to enter the atmosphere and warm the Earth's surface and prevent some infrared radiation emitted by the Earth from escaping back into space. The largest anthropogenic source of GHGs is fossil fuel combustion, which results primarily in carbon dioxide (CO_2) emissions. Human activity contributes to emissions of six primary GHGs: CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF_6).

Carbon dioxide emissions occur largely from combustion of fossil fuels. Other GHG emissions tracked by State inventories occur in much smaller quantities. However, the global warming potential of CH_4 is about 21 times that of CO_2. The use of sulfur hexafluoride or SF_6 in power transformers and circuit breakers at power plants, switchyards, and substations also poses a concern, because this pollutant can slowly escape from the equipment, and it has an extremely high global warming potential (one pound of SF_6 is the equivalent warming potential of approximately 23,900 pounds of CO_2). When quantifying GHG emissions, the different global warming potentials of GHG pollutants are usually taken into account by normalizing their rates to an equivalent CO_2 emission rate (CO2e).

California produced approximately 457 million metric tons of CO2 equivalent (457 MMTCO2e) in 2009, according to the most recent statewide inventory (CARB, 2011).[3] This represents a decrease of 5.8 percent from 2008, during which approximately 485 MMTCO2e were emitted, or about one percent of 49,000 MMTCO2e emitted globally (IPCC, 2007a). The main sources of GHG emissions in California are the transportation and energy sectors.

How global climate change may affect California's public health, infrastructure, and natural resources is described in the 2009 Biennial Report of the California Climate Action Team (Cal EPA, 2010). The Climate Action Team found that:

> *Extreme events from heat waves, floods, droughts, wildfires and bad air quality are likely to become more frequent in the future and pose serious challenges to Californians. They pose growing demands on individuals, businesses and governments at the local, state, and federal levels to minimize vulnerabilities, prepare ahead of time, respond effectively, and recover and rebuild with a changing climate and environment in mind.*

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3 One metric ton (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.

Recent findings from the California Climate Change Center[4] assess the local and statewide vulnerabilities in a 2012 report, as follows:

> Our Changing Climate 2012 *highlights important new insights and data, using probabilistic and detailed climate projections and refined topographic, demographic and land use information. The findings include:*
>
> - *The state's electricity system is more vulnerable than was previously understood.*
> - *The Sacramento–San Joaquin Delta is sinking, putting levees at growing risk.*
> - *Wind and waves, in addition to faster rising seas, will worsen coastal flooding.*
> - *Animals and plants need connected "migration corridors" to allow them to move to more suitable habitats to avoid serious impacts.*
> - *Native freshwater fish are particularly threatened by climate change.*
> - *Minority and low-income communities face the greatest risks from climate change.*
> - *There are effective ways to prepare for and manage climate change risks, but local governments face many barriers to adapting to climate change; these can be addressed so that California can continue to prosper.*

Applicable Regulations

The Proposed Project would be in the Bay Area Air Quality Management District (BAAQMD). Emissions from project-related construction and operational activities would occur within the jurisdiction of the BAAQMD and the California Air Resources Board (CARB).

USEPA GHG Mandatory Reporting Program (40 CFR Part 98). This rule requires mandatory reporting of GHG emissions for industrial facilities and power plants that emit more than 25,000 MTCO2e emissions per year. Currently, there are no federal regulations limiting GHG emissions from the Proposed Project.

California Global Warming Solutions Act (AB 32). The California Global Warming Solutions Act of 2006, Assembly Bill 32 (AB 32) requires that California's greenhouse gas (GHG) emissions be reduced to 1990 levels (427 MMTCO2e) by 2020. The reduction will be accomplished through an enforceable statewide cap on global warming emissions to be phased in beginning 2012. AB 32 directs the CARB to develop regulations and a mandatory reporting system to track and monitor global warming emissions levels (AB 32, Chapter 488, Statutes of 2006). The CARB Climate Change Scoping Plan, approved December 2008, provides the framework for achieving California's goals.

In passing AB 32, the California Legislature found that:

> *Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.*

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[4] The California Energy Commission's California Climate Change Center collaborates to prepare periodic science reports for the California Environmental Protection Agency (Cal/EPA). Guided by a Steering Committee of senior technical staff from State agencies and outside scientific experts, 26 research teams from the University of California system and other research groups produced more than 30 peer-reviewed papers. Available at: http://www.climatechange.ca.gov/adaptation/third_assessment/.

The regulations implementing AB 32 are being phased-in at this time. Implementation of the Climate Change Scoping Plan requires careful coordination on the State's energy policies, meaning that CPUC and CARB work together closely to implement the recommendations in the Scoping Plan, especially one key element of the plan, the Renewable Portfolio Standard (RPS). In April 2011, Senate Bill 2 of the 1st Extraordinary Session (SB X1-2) was signed into law. Regulations in the Public Utilities Code (§ 399.30) under SB X1-2 expressly apply the new 33 percent RPS by December 31, 2020 to all retail sellers of electricity and establish renewable energy standards for interim years prior to 2020. Additionally, the Intergovernmental Panel on Climate Change (IPCC), an international scientific body, has established that one of its Key Mitigation Technologies and Practices for Energy Supply is improved energy supply and distribution efficiency (IPCC, 2007b).

CPUC GHG Emissions Performance Standard. To guide the power procurement activities of the regulated California utilities, including PG&E, in 2007 the CPUC established a GHG limit under the Electricity Greenhouse Gas Emission Standards Act (SB 1368[5]), which requires that generation and contracts be subject to a GHG Environmental Performance Standard of 1,100 pounds (or 0.5 metric tons) of carbon dioxide (CO_2) per megawatt-hour (MWh) of electricity produced. The Emissions Performance Standard applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or longer, including contracts with power plants located outside of California.[6]

Mandatory Reporting of Greenhouse Gas Emissions (17 CCR 95100). Mandatory reporting of GHG emissions applies to electric generating facilities with a nameplate capacity equal or greater than 1 MW capacity and GHG emissions exceeding 2,500 metric tons per year. As an Electric Power Entity under this rule, PG&E must report GHG emissions associated with providing electricity to end-use customers.

CARB SF_6 Regulations (17 CCR 95350). In 2010, CARB adopted a regulation for reducing SF_6 emissions from electric power system gas insulated switchgear. The regulation requires owners of such switchgear to: (1) annually report their SF_6 emissions; (2) determine the emission rate relative to the SF_6 capacity of the switchgear; (3) provide a complete inventory of all gas insulated switchgear and their SF_6 capacities; (4) produce a SF_6 gas container inventory; and (5) keep all information current for CARB enforcement staff inspection and verification.

City and County of San Francisco, Strategies to Address Greenhouse Gas Emissions. The City has developed a number of plans and programs to reduce the City's contribution to global climate change. Collectively known as the City's Greenhouse Gas Reduction Strategy, in 2010, the compilation of policies, programs and regulations adopted by the City was found to be consistent with and to achieve reductions exceeding the State's AB 32 goals (BAAQMD, 2010b). San Francisco's Greenhouse Gas Reduction Strategy documents the City's actions to pursue cleaner energy, energy conservation, alternative transportation and solid waste policies. As identified in the Greenhouse Gas Reduction Strategy, the City has implemented a number of mandatory requirements and incentives that have measurably reduced GHG emissions including, but not limited to, increasing the energy efficiency of new and existing buildings, installation of solar panels on building roofs, implementation of a green building strategy, adoption of a zero waste strategy, a construction and demolition debris recovery ordinance, a solar energy generation subsidy, incorporation of alternative fuel vehicles in the City's transportation fleet (including buses), and a mandatory recycling and composting ordinance.

5 Public Utilities Code § 8340 et seq.

6 See Rule at http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs (see Table 5.7-1), as well as any adopted mitigation measures identified by this Initial Study.

Table 5.7-1. Applicant Proposed Measures (APMs) Related to Greenhouse Gas Emissions

APM Number	Issue Area
	Greenhouse Gas Emissions
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 SF6 Emissions.** PG&E will include Potrero Switchyard in PG&E’s system-wide SF6 emission reduction program, which includes inventorying and monitoring system-wide SF6 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 SF6 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 SF6 Emission Reduction Partnership for Electric Power Systems, a voluntary program between the USEPA and electric power companies that focuses on reducing emissions of SF6 from transmission and distribution operations. Since 1998, PG&E has reduced its SF6 leakage rate by 89 percent and absolute SF6 emissions by 83 percent.
- PG&E supports Natural Gas STAR, a program promoting the reduction of CH4 from natural gas pipeline operations. Since 1998, PG&E has avoided the release of thousands of tons of CH4.
- 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.

Table 5.7-1. Applicant Proposed Measures (APMs) Related to Greenhouse Gas Emissions

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.

5.7.2 Environmental Impacts and Mitigation Measures

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

LESS THAN SIGNIFICANT – CONSTRUCTION. Construction of the proposed transmission line and other project facilities would result in emission of GHGs from construction equipment at the various work areas and off-site motor vehicle and marine vessel trips carrying workers and materials. Motor vehicles, marine vessels, and other construction equipment would directly emit CO_2, CH_4, and N_2O due to fuel use and combustion. Motor vehicle fuel combustion emissions in terms of CO2e are approximately 95 percent CO_2, and CH_4 and N_2O emissions occur at rates of less than 1 percent of the mass of combustion CO_2 emissions. Other GHGs such as SF_6, hydrofluorocarbons, and perfluorocarbons were not included in the construction emission calculations because construction activities would not emit these GHG constituents.

Emissions for each phase and for each month of proposed activity are summarized in Appendix A as part of the detailed emission calculations based on the proposed quantities and types of equipment. The emission estimates rely on factors from the CARB EMFAC2011 model and the California Emissions Estimator Model (CalEEMod), and other resources. Based on the construction activity forecast, approximately 920 MTCO2e would be emitted over the entire construction phase of the Proposed Project. The construction emissions would be reduced to approximately 775 MTCO2e with implementation of the air quality-related APM AQ-2 (Minimize Construction Exhaust Emissions) and APM GHG-1, which aim to reduce short-term GHG emissions through an efficiently mobilized workforce, use of electric grid-powered equipment, and minimizing unnecessary idling or equipment use. Construction-related emissions would be spread over the development phase of roughly two years and would not recur over the life of the project, but these levels would be under the threshold level of 2,500 metric tons for annual mandatory reporting of GHG (17 CCR 95100) and well below the draft threshold level of 10,000 metric tons for annually recurring emissions from stationary sources (BAAQMD, 2010a). With total project construction emissions of approximately 775 MTCO2e (Table 5.7-2), construction-related GHG emissions would not have a significant impact on the environment, and the impact would be less than significant.

Table 5.7-2. Estimated Construction Emissions, GHG

Proposed Emissions Sources	Total CO2e During Construction (MTCO2e)
Construction Year 2014: Land Installation (Mobilization, Manholes, and Trenching); HDD Drilling (HDD Send Pit Excavation, HDD Bore, Casing Fuse, and Pull In Casing); Switchyard Construction (General Construction, Structure Foundation Excavation, Structure Delivery and Setup, and Cable Installation)	289.68
Construction Year 2015: Land Installation (Trenching and Cable Installation); HDD Drilling (HDD Send Pit Excavation, HDD Bore, Casing Fuse, Pull In Casing, and Restoration); Offshore Installation of the Submarine Route; Switchyard Construction (General Construction, Cable Installation, and Cleaning and Landscaping)	629.90
Total During Construction	**919.58**
Construction Year 2014 (with implementation of APM AQ-2 and GHG-1)	239.99
Construction Year 2015 (with implementation of APM AQ-2 and GHG-1)	535.46
Total During Construction with APMs	**775.46**

Source: See Appendix A (Table A-2 and Table A-3) for detailed calculations (PG&E, 2013).

LESS THAN SIGNIFICANT – OPERATION AND MAINTENANCE. Maintenance of the proposed transmission line and other project facilities would be incorporated into existing PG&E activities so GHG emissions from operation and maintenance activities would not notably increase as a result of this project.

The proposed installation of seven new circuit breakers at the Potrero Switchyard would introduce new gas insulated switchgear that would be a source of GHG due to the leakage of SF_6. These quantity of potential SF_6 emissions and the total rate in terms of CO2e are presented in Table 5.7-3. The new circuit breakers would be required to comply with the CARB-adopted standards for SF_6 use in gas insulated circuit breakers. Based on SF_6 emission rates at the maximum leakage rate allowed by the manufacturer of 0.5 percent, the CARB requirements for control of SF_6 and recordkeeping, and the application of APM GHG-2, the actual GHG emissions would be minor at 66 MTCO2e/yr (PG&E, 2012a). This level of GHG would not have a significant impact on the environment, and the impact associated with the GHG emissions would be less than significant.

Table 5.7-3. Estimated GHG Emissions from Gas-Insulated Switchgear

Emissions Sources	SF_6 (lb/yr)	SF_6 (metric ton/yr)	CO2e (MTCO2e/yr)
Circuit Breakers, 175 lb SF_6 per breaker, at 0.5% annual leak rate	6.125	0.0028	66.4

Source: See Appendix A (Table A-13) for detailed calculations (PG&E, 2013).

b Conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

LESS THAN SIGNIFICANT. The Climate Change Scoping Plan, approved by CARB in 2008 (CARB, 2008), provides an outline of actions to reduce California's GHG emissions. The scoping plan requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs.

The Proposed Project would improve the infrastructure used in distribution of California's energy supply, and would not affect California's ability to supply renewable energy. The Proposed Project would not affect PG&E's ability to meet its RPS obligations. Similarly, the Proposed Project would not affect or conflict with any goals or programs established by the City and County of San Francisco to achieve GHG reduction targets.

PG&E would comply with CARB SF_6 regulations to inventory, report, and minimize SF_6 leaks through the use of new technology. By complying with these requirements, the Proposed Project would not conflict with any applicable GHG management plan, policy, or regulation. Therefore, this impact would be less than significant.

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5.8 Hazards and Hazardous Materials

HAZARDS AND HAZARDOUS MATERIALS Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	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?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

5.8.1 Setting

This section addresses issues related to environmental hazards and hazardous materials in the existing conditions. Environmental hazards include accidental spills of hazardous materials, the presence of existing subsurface contamination, the risk of wildfire, and aircraft safety. Hazardous materials include fuel, oil, and lubricants. If encountered, contaminated soil can pose a health and safety threat to workers or the public.

Existing and Past Land Use Activities

Existing and past land use activities are commonly used as indicators of sites or areas with potential for hazardous material storage and use or potential environmental contamination. For example, many industrial sites, historic and current, have soil or groundwater contamination by hazardous substances. Other hazardous materials sources include leaking underground tanks in commercial and rural areas, contaminated surface runoff from polluted sites, and contaminated groundwater plumes.

The proposed PG&E Embarcadero-Potrero 230 kV Transmission Project would be located in the City and County of San Francisco and the transmission line route would traverse highly urbanized areas of San

Francisco; the underwater section of the transmission line route would be located just offshore within the adjacent San Francisco Bay. Land use along the proposed northern segment is primarily light industrial, commercial, and high density residential and office space. The proposed southern segment along 23rd Street and the proposed switchyard site is in heavy industrial use. The offshore segment of the transmission line would be approximately 2.5 miles long and approximately 1,500 to 2,500 feet from the San Francisco shoreline, roughly paralleling the waterfront from Pier 30/32 to 23rd Street.

Hazardous Materials

Construction activities routinely involve use and storage of hazardous materials such as cleaning solvents, paints, adhesives, vehicle fuels, oil, hydraulic fluid, and other vehicle and equipment maintenance fluids. The use and storage of such materials must comply with federal and state regulations. Hazardous material use during operation and maintenance of the proposed switchyard and transmission line would be limited to lubricating and cooling oils at the switchyard and motor vehicles fluids associated with line inspection vehicles. No acutely hazardous materials would be associated with construction, maintenance, or operation of the project.

Environmental Contamination

The project area is located within the vicinity of commercial or industrial sites with known contamination and sites that store and use large quantities of hazardous materials where unknown contamination may be present.

Portions of the onshore segments of the project alignment are underlain by artificial fill that is mapped as being in areas covered under the San Francisco Maher Ordinance (SFDPH, 2013). The Maher Ordinance requires soil analysis for a specified list of inorganic and organic chemicals at construction sites where: (1) at least 50 cubic yards of soil are disturbed; (2) there is construction on the bayside of the 1906 high-tide line; or (3) there is reason to believe that hazardous waste may be present. 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 is estimated to range from 6 to 15 feet (Black & Veatch, 2012).

PG&E's Proponent's Environmental Assessment (PEA) includes the results of an environmental information database search by Environmental Data Resources, Inc. (EDR) and the State Water Resources Control Board's (SWRCB) GeoTracker website for properties of potential environmental concern related to construction of the PG&E Embarcadero Potrero 230 kV Transmission Project. The EDR database included an environmental data search of federal, State and local directories listing sites with known releases of hazardous materials, facilities registered as hazardous waste generators, sites with registered underground storage tanks (USTs), and sites once considered likely to use or store hazardous substances. The EDR study identified all sites with active or closed environmental status within a 0.25-mile corridor either side of the onshore route segments (EDR, 2023). The database was reviewed for sites with the greatest potential for environmental impact to project components.

Three sites are listed in both the EDR database and the GeoTracker site with significant environmental contamination issues along the southern segment and at the proposed Potrero 230 kV Switchyard, as listed below and shown in Figure 5.8-1:

- ***Eastern Portion of 1201 Illinois Street, Former PG&E Potrero Power Plant, currently owned by GenOn Energy.*** The former PG&E Potrero Power Plant is part of the larger former Potrero Manufactured Gas Plant (MGP) Remediation Site. The Remediation Site was divided into seven work areas to facilitate the remediation process; four of these work areas encompass the former PG&E Potrero Power Plant, now owned by GenOn Energy (PG&E, 2013). The primary impacts at this site are associated with MGP residues, but also include environmental impacts from the former operation of the Potrero Power Plant. 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, 2012a). Contaminants found at this site include naturally occurring asbestos, heavy metals, polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), and volatile organic compounds (VOCs) (SWRCB, 2013). The naturally occurring asbestos contaminants found at the site are known to be associated with fill material that includes serpentinite which is found in bedrock at the site and surrounding areas. As owner of the site when the contamination occurred, PG&E is in the process of investigation and remediation at this site, under oversight by the SWRCB (PG&E, 2012a). PG&E is in the process of developing a Site Management Plan (SMP) for the excavation of subsurface materials for the western portion (Station A area) of the GenOn Energy property (SWRCB, 2013). This SMP for the former Potrero Power Plant is likely to be similar to the SMP that has already been approved for Potrero Switchyard, described below (PG&E, 2012a).

- ***Western Portion (Parcels 1 and 2) of 1201 Illinois Street, Potrero Switchyard, PG&E.*** The primary impacts at the site are associated with MGP residues, but also include environmental impacts from historic operation of the switchyard, 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, approved by the RWQCB, and recorded by the City and County of San Francisco in January 2012 (SWRCB, 2013). The Environmental Restriction includes a SMP that applies to subsurface work within the specified property boundaries, requires 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 (SWRCB, 2013).
- ***435, 525, and 555 23rd Street, Trans Bay Cable Converter Station Site, Harrigan Weidenmuller Company.*** 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, approved by RWQCB, and recorded by the City and County of San Francisco in January 2011 (RWQCB, 2013). This document requires adherence to a site specific Risk Management Plan (RMP) and SMP for all soil and groundwater disturbances (SWRCB, 2013). While the project does not include work within this site, contaminated groundwater may be encountered in project trenches near this site due to the shallow groundwater in the area, which could require that work in this area adhere to this site's RMP and SMP.

No sites with significant environmental contamination were identified along the northern onshore segment route in the EDR database or by GeoTracker, however numerous LUST and former and current UST sites were identified along this alignment (PG&E, 2012a). Most of the LUST sites are designated Case Closed (EDR, 2012; SWRCB, 2013). While the presence of these case closed LUSTs and UST sites along the alignment indicates a low potential for contamination along this portion of the transmission line, unknown contamination of the soil or shallow groundwater may have occurred.

The offshore segment of the transmission line passes near and through an area of known contaminated sediments in the vicinity of the former Potrero MGP. Known contaminants in the area include polynuclear aromatic hydrocarbons (PAHs), polybrominated diphenyl ethers (PBDEs), and polychlorinated biphenyls (PCBs). PG&E has conducted four phases of sediment investigations between 2009 and summer 2012. PG&E indicates that a Remedial Investigation (RI) Report, which will present the results of their recent investigations in the area, will be prepared this year, and a Remedial Action Plan, remedial design and permitting will be prepared in 2015 and 2016. Remediation of the area is anticipated in 2017 (PG&E, 2013). The estimated schedule for construction of the offshore segment of the transmission line would be between June 2015 to November 2015 (PG&E, 2012a), which is before the anticipated PG&E remediation of the area, and thus contaminated sediment may be disturbed by the hydroplow during cable installation.

Schools

The proposed transmission line route would be adjacent to a private day care center, the Bright Horizons/ Marin Day School at Hills Plaza on Spear Street. No public schools would be within 0.25 miles of the Proposed Project components. However, two other nearby day care pre-schools would be located near project activity downtown, and their approximate distances are listed below:

- Bright Horizons at 221 Main Street. Located approximately 300 feet northwest of north segment.
- Bright Horizons/Marin Day Schools at 220 Spear Street. Located approximately 400 feet northwest of north segment.

Airports and Airstrips

No public airports or private airstrips are within 2 miles of the Proposed Project.

Electric and Magnetic Fields

As described in Section 4.15, electric voltage and electric current from transmission lines create electromagnetic fields (EMF). Possible health effects associated with exposure to EMF have been the subject of scientific investigation since the 1970s, and there continues to be public concern about the health effects of EMF exposure. However, EMF is not addressed here as an environmental impact under CEQA. The CPUC has repeatedly recognized that EMF is not an environmental impact to be analyzed in the context of CEQA because (1) there is no agreement among scientists that EMF does create a potential health risk, and (2) there are no defined or adopted CEQA standards for defining health risks from EMF. Section 4.15 presents information about EMF, current magnetic fields in the project area, and PG&E's proposed measures to reduce magnetic fields in accordance with CPUC requirements.

Applicable Regulations

Hazardous substances are defined by federal and State regulations that aim to protect public health and the environment. Hazardous materials have certain chemical, physical, or infectious properties that cause them to be considered hazardous. Hazardous materials are defined in the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 101(14), the California Health and Safety Code, Division 20, Chapter 6.5, and the California Code of Regulations (CCR), Title 22, Div. 4.5, Chapter 11.

A hazardous material is defined by the California Code of Regulations as follows: any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

The CCR provides the following definition of hazardous waste.

A material may be defined as hazardous waste if it has one or more of the following characteristics:

> *(1) a waste that may (A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when it is improperly treated, stored, transported, disposed of or otherwise managed; and*
>
> *(2) the characteristic can be: (A) measured by an available standardized test method which is reasonably within the capability of generators of waste or private sector laboratories that are certified by the Department pursuant to Chapter 44 of this division and available to serve generators of waste; or (B) reasonably detected by generators of waste through their knowledge of their waste.*

For this analysis, soil that is excavated from a site containing hazardous materials would be considered to be a hazardous waste if it exceeded criteria outlined in CCR Title 22, Div. 4.5, Chapter 11 or criteria identified by oversight agencies such as the DTSC or the local CUPA. Remediation (cleanup and safe removal/disposal) of hazardous wastes found at a site is required if excavation of these materials occurs; it may also be required if certain other activities occur. Even if soils or groundwater at a contaminated site do not have the characteristics required to be defined as hazardous wastes, remediation of the site may be required by regulatory agencies subject to jurisdictional authority. Cleanup requirements are determined on a case-by-case basis by the agency taking lead jurisdiction.

Federal

The federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 (RCRA) established a program administered by the U.S. Environmental Protection Agency (EPA) for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the “cradle to grave” system of regulating hazardous wastes. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by HSWA.

CERCLA, including the Superfund program, was enacted by Congress on December 11, 1980. This law provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for cleanup when no responsible party could be identified. CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, and/or contaminants. The NCP also established the National Priorities List (NPL). CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986.

State

The California Environmental Protection Agency (Cal/EPA) was created in 1991, which unified California’s environmental authority in a single cabinet-level agency and brought the Air Resources Board (ARB), State Water Resources Control Board (SWRCB), Regional Water Quality Control Boards (RWQCBs), Integrated Waste Management Board (IWMB), DTSC, Office of Environmental Health Hazard Assessment (OEHHA), and Department of Pesticide Regulation (DPR) under one agency. These agencies were placed within the Cal/EPA “umbrella” for the protection of human health and the environment and to ensure the coordinated deployment of State resources. Their mission is to restore, protect and enhance the environment, to ensure public health, environmental quality, and economic vitality.

The California Hazardous Waste Control Law (HWCL) is administered by Cal/EPA to regulate hazardous wastes. The HWCL lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal and transportation; and identifies some wastes that cannot be disposed of in landfills.

Department of Toxic Substance Control (DTSC) is a department of Cal/EPA and is the primary agency in California that regulates hazardous waste, cleans-up existing contamination, and looks for ways to reduce the hazardous waste produced in California. DTSC regulates hazardous waste in California primarily under the authority of RCRA and the California Health and Safety Code. Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

The California Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. Cal/OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340.2). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

In 1993 the State (Cal/EPA) was mandated by Senate Bill 1082 (Health and Safety Code Chapter 6.11) to establish a “unified hazardous waste and hazardous materials management” regulatory program (Unified Program). The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of the following six environmental and emergency response programs:

- Hazardous Materials Release Response Plans and Inventories (Business Plans),
- California Accidental Release Prevention (CalARP) Program,
- Underground Storage Tank Program,
- Aboveground Petroleum Storage Act,
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs,
- California Uniform Fire Code: Hazardous Material Management Plans and Hazardous Material Inventory Statements.

The Unified Program is implemented at the local level by various local government agencies certified by the Secretary of Cal/EPA. These agencies, known as Certified Unified Program Agencies (CUPA), implement all of the Unified Program elements and serve as a local contact for area businesses. The San Francisco Department of Public Health (SFDPH), Environmental Health Section is certified by Cal/EPA as the CUPA for the City and County of San Francisco.

Local

While the project is not subject to local discretionary regulations, being under exclusive CPUC jurisdiction for the siting, design, and construction of the project, the following local City and County of San Francisco regulation is provided for informational purposes and to assist with CEQA review. 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.

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 includes areas of San Francisco bayward of the pre-1906 earthquake high tide line (SFDPH, 2012). These areas of San Francisco are largely underlain by artificial fill in areas where past industrial land uses and debris fill from 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.

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study (see Table 5.8-1).

Table 5.8-1. Applicant Proposed Measures (APMs) Related to Hazards and Hazardous Materials

APM Number	Issue Area
	Hazards and Hazardous Materials
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), 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 PEA Section 3.9, Hydrology and Water Quality. ▪ Stopping work at that location and contacting the CUPA (SFDPH Environmental Health Section; see PEA 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. *(Also see APM WQ-1 and APM WQ-3 in PEA Section 3.9.4.2)*

Table 5.8-1. Applicant Proposed Measures (APMs) Related to Hazards and Hazardous Materials

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 PEA Section 3.8.3.1), as well as the Maher Ordinance (see PEA Section 3.8.2.1).
APM HM-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 up, it will be removed and transported for disposal, according to applicable regulations. *(Also see APM WQ-4.)*
APM HM-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. *(Also see APM WQ-5.)*
APM HM-6	**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. *(Also see APM WQ-6 and APM WQ-7.)*

Table 5.8-1. Applicant Proposed Measures (APMs) Related to Hazards and Hazardous Materials

APM HM-7	**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. *(Also see APM WQ-8.)*
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. 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-3	**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. *(Also see APM HM-1.)*

Table 5.8-1. Applicant Proposed Measures (APMs) Related to Hazards and Hazardous Materials

APM WQ-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. *(Also see APM HM-4.)*
APM WQ-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. *(Also see APM HM-5.)*
APM WQ-6	**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 PEA 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. *(Also see APM HM-6 and APM WQ-7.)*
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.

Table 5.8-1. Applicant Proposed Measures (APMs) Related to Hazards and Hazardous Materials

APM WQ-8	**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. *(Also see APM HM-7.)*

5.8.2 Environmental Impacts and Mitigation Measures

a. *Would 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 – CONSTRUCTION. No acutely hazardous materials would be associated with construction, maintenance, or operation of the project. During construction, hazardous materials would be limited to substances associated with construction vehicles and equipment, such as cleaning solvents, paints, adhesives, vehicle fuels, oil, hydraulic fluid, and other vehicle and equipment maintenance fluids. Any chemicals used and stored at construction yards or onsite for the project would be managed in accordance with all applicable regulations, and 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 (PG&E, 2012a). PG&E would implement the following hazardous material control measures as part of APMs HM-1 through HM-4: 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; any chemicals stored onsite for the project would be managed in accordance with all applicable regulations; all hazardous materials and hazardous wastes would be handled, stored, and disposed of in accordance with all applicable regulations by personnel qualified to handle hazardous materials; Material Safety Data Sheets (MSDS) would be maintained and kept available on site, as applicable; and emergency spill supplies and equipment will be available during construction and used in the event of minor releases of oil or other construction-related fluids. Additionally, as specified under APM WQ-1, PG&E would prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) that would include erosion control and pollution prevention measures during construction activities.

Implementation of APMs HM-1 (Implementation of Hazardous Material and Emergency Response Procedures), HM-2 (Development and Implementation of a Health and Safety Plan), HM-4 (Emergency Supplies and Equipment), and WQ-1 (Development and Implementation of a Stormwater Pollution Prevention Plan) for all portions of the project would ensure that any hazardous materials used and stored as part of project construction are handled, stored, and disposed of in accordance with all applicable regulations, thus limiting the potential for exposure of the public or environment to hazardous materials.

Construction of the offshore portion of the transmission line could potentially expose the bay environment to contamination from drilling fluids, and while most drilling fluids are not considered hazardous substances, they could cause contamination of the sediment and water in the bay that is harmful to the native flora and fauna. Implementation of APMs HM-6 (Horizontal Directional Drilling [HDD] Drilling Fluid and Cuttings Monitoring and Management, see also WQ-6) for the offshore portions of the project would reduce the potential for drilling fluid to cause offshore contamination, thus impacts would be less than significant.

Components of the Proposed Project where ground disturbance would occur would be susceptible to encountering existing known and unknown environmental contamination. The likelihood of encountering contamination would be high in the vicinity of commercial or industrial sites with known contamination or adjacent to sites that store and use large quantities of hazardous materials where unknown contamination may be present. The proposed ground disturbing activities would be as follows:

- Trenching and excavation for the duct banks, vaults, and underground transmission line sections connecting to the Potrero Switchyard and Embarcadero Substation. Materials removed during trench excavation would be placed directly into trucks and removed from the area and disposed of off-site. The estimated total amount of excavated materials to be disposed of would be 6,000 cubic yards (cy) for duct bank and vaults.
- Horizontal directional drilling at the two HDD transitions from land to the submarine environment, with each transition location involving three HDD borings approximately 1,000 feet in length, excavation for HDD entry pits, splice vaults, and offshore dredging for the exit pit to collect drilling mud. The estimated total amount of excavated materials to be disposed of for the onshore HDD entry pits would be 300 cy.
- Grading and excavation for construction of the new Potrero 230 kV Switchyard near the existing Potrero 115 kV Switchyard. Soil contamination is known to exist at the proposed switchyard site and up to 8,000 cy of contaminated soil removal would be required.
- Installation of the offshore transmission line at generally a minimum depth of 6 feet under the surface of the San Francisco Bay sediments by using a hydroplow pulled along the seabed behind a barge. The majority of the fluidized sediments behind the blade would fall back into the trench, effectively burying the cable and avoiding the need to dredge excavated materials along the submarine transmission line route.

Contaminated soil that would be encountered during onshore construction along the southern segment, and potentially along the northern segment, and that could be classified as hazardous material would be excavated and transported to disposal sites. In areas of known or potential environmental contamination, APM HM-5 (Soil, Groundwater, and Underground Tank Characterization) would be implemented prior to project construction to verify the presence or absence of environmental contamination and develop and implement appropriate handling and disposal practices for contaminated soil or groundwater. In the event previously unknown suspected soil or groundwater contamination is encountered during construction, as part of APM HM-5, work would be stopped until the material is characterized by laboratory testing and appropriate handling and disposal methods have been emplaced. Additionally implementation of APM HM-1 (Implementation of Hazardous Material and Emergency Response Procedures), APM HM-2 (Development and Implementation of a Health and Safety Plan), APM HM-3 (Adherence to Applicable Site-specific RMPs and SMPs), and APM HM-4 (Emergency Supplies and Equipment), which require adherence to hazardous material and emergency response procedures, a project-specific SWPPP, and project-specific health and safety plans, would ensure that impacts from excavation of contaminated soil or groundwater would be less than significant.

As part of APM HM-7 (Sediment Testing Program for Submarine Cable Installation) (see also APM WQ-8), bay sediment excavated for the HDD exit pits would be sampled and handled according to a Sampling and Analysis Plan in coordination with the DMMO. As part of the APM the flow rate of the pressure jets and the rate of hydroplow advancement would be adjusted in areas of contamination to limit turbidity and potential migration of contaminated sediments within the offshore portions of the transmission line. APM HM-7 (WQ-8) would be implemented prior to construction of the offshore segment of the transmission line to ensure impacts from underwater excavation of contaminated soil would be less than significant.

LESS THAN SIGNIFICANT – OPERATION AND MAINTENANCE. Hazardous materials such as lubricating and cooling oils at the switchyard and motor vehicles fluids associated with line inspection vehicles would be used during operation and maintenance of the proposed switchyard at Potrero, at Embarcadero Substation, and along the transmission line. PG&E's existing hazardous substance control and emergency response plans to be used during the operation and maintenance phases of the project would be updated as appropriate to incorporate necessary modifications resulting from this project. The health and safety plans for Potrero Switchyard and Embarcadero Substation would be modified and adhered to as appropriate, as specified in APM HM-1 (Implementation of Hazardous Material and Emergency Response Procedures) and APM HM-2 (Development and Implementation of a Health and Safety Plan). Implementation of these measures would result in a less than significant impact during operation and maintenance of the project.

b. Would 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. Leaks or spills of cleaning solvents, paints, adhesives, lubricants, vehicle fuels, oil, hydraulic fluid, and other vehicle and equipment maintenance fluids could occur during project construction or operation and maintenance activities, and could result in soil or groundwater contamination. PG&E would implement the following hazardous material control measures as part of APMs HM-1 through HM-4: 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; any chemicals stored onsite for the project would be managed in accordance with all applicable regulations; all hazardous materials and hazardous wastes would be handled, stored, and disposed of in accordance with all applicable regulations by personnel qualified to handle hazardous materials; Material Safety Data Sheets (MSDS) would be maintained and kept available on site, as applicable; and emergency spill supplies and equipment will be available during construction and used in the event of minor releases of oil or other construction-related fluids (PG&E, 2012a). Additionally, as specified in APM WQ-1, PG&E would prepare and implement a SWPPP that would include pollution prevention measures during construction.

Also, as discussed in Item (a) above, contaminated soil that could be excavated and classified as hazardous material would be transported to disposal sites during the onshore construction process, potentially exposing the public to hazardous materials.

To address long-term operation and maintenance of the project, PG&E's existing facilities include operational hazardous substance control and emergency response plans that would be updated and adhered to as required by APM HM-2. The Potrero Switchyard and Embarcadero Substation Health and Safety Plans would incorporate necessary modifications resulting from project construction at these facilities (APM HM-2) (PG&E, 2012a).

Implementation of the required SWPPP, personnel training for construction and operation of the Proposed Project, and APMs HM-1 through HM-6 for spill prevention and hazardous substance control and disposal would reduce the potential impact from upset or accidental spills of hazardous materials to a less than significant level.

c. Would 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. Hazardous materials to be used during the construction and operation of the Proposed Project would consist of low toxicity materials including gasoline, diesel fuel, oil, and lubricants associated with construction and switchyard equipment and vehicles. While there are two identified schools located within 0.25 miles of the northern segment of the proposed 230 kV transmission line, the low toxicity of the materials associated with the project, proper handling, storage, and disposal practices of all hazardous materials in accordance with applicable regulations, and implementation of APMs HM-1 and HM-2 would reduce impacts to area schools to a less than significant level.

d. Would the project be located on a site that 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. The southern segment of the proposed 230 kV transmission line and the proposed 230 kV switchyard would be located on and adjacent to several sites that are or have been listed as hazardous material sites. These include the GenOn property on the eastern portion of 1201 Illinois Street (former PG&E Potrero Power Plant and former Potrero MGP), the existing Potrero 115 kV Switchyard on the western portion of 1201 Illinois Street, and the Trans Bay Cable Converter Station on the southern side of 23rd Street. Both the existing PG&E switchyard and the Trans Bay Cable sites are now designated Case Closed by the RWQCB and have deed restrictions and Site Management Plans which have specific requirements for projects at the sites that include restrictions regarding disturbance of the subsurface soil and extraction of groundwater from the subject properties. The GenOn site of the proposed 230 kV switchyard is still under active regulatory oversight by the Regional Water Quality Control Board, San Francisco Bay Region. PG&E is in the process of preparing a Site Management Plan (SMP) to protect site users from exposure to residual contaminants under current site conditions and to ensure that any soil or contaminated groundwater underneath the cap that becomes exposed during routine construction operations is handled and disposed of in an appropriate manner, and appropriate worker protection is used during excavation to protect them from exposure to known contaminants. Implementation of APMs HM-3 and HM-5 would ensure that construction activities at known hazardous materials sites will have less than significant impacts. Generally operations and maintenance activities for the project would not include ground disturbance, however, in the event disturbance of soil and/or groundwater becomes necessary at the listed hazardous materials sites for maintenance activities, PG&E would be required to follow the soil management plans and other policies in place as directed by the RWQCB or other regulatory agency, resulting in a less than significant impact.

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 would not be within an airport land use plan nor within two miles of an airport. As such, no impact would 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. There are no private airstrips in the vicinity of the project. As such, no impact would occur related to safety of people residing or working in the project area.

g. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

LESS THAN SIGNIFICANT. Construction-related temporary travel lane closures or disruptions that would be necessary during construction or operation and maintenance would be coordinated as specified in Transportation and Traffic APM TR-1 (Traffic Management Implementation). Additionally, any road closures would follow applicable regulations and would not impede emergency response. The project would not impair the implementation of or physically interfere with an adopted emergency response or evacuation plan; therefore, the impact that would occur related to emergency response during construction would be less than significant. Operation and maintenance of the Proposed Project would not increase demands on existing emergency response services and would therefore have no impact on adopted emergency response plans or emergency evacuation plans.

h. Would 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 within the project area, and the San Francisco area is not included on the CAL FIRE wildland fire hazard maps (CAL FIRE, 2013); therefore, the project would have no impact related to wildland fires.

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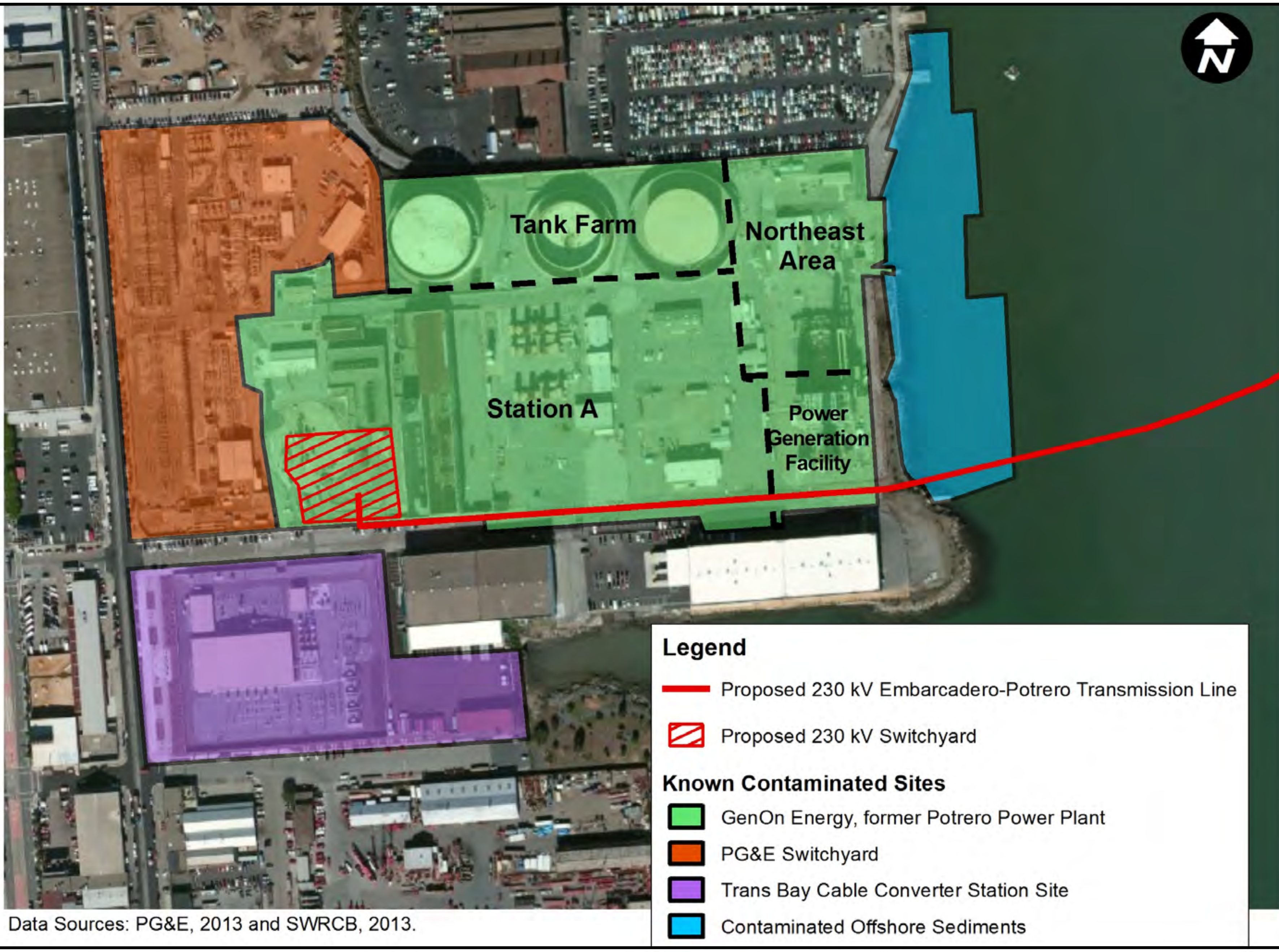

Data Sources: PG&E, 2013 and SWRCB, 2013.

Aspen Environmental Group

Figure 5.8-1

Contaminated Sites and Potrero Switchyard

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5.9 Hydrology and Water Quality

HYDROLOGY AND WATER QUALITY Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Violate Regional Water Quality Control Board water quality standards or waste discharge requirements?	☐	☐	☒	☐
b. Substantially deplete groundwater supplies or interfere substantially with groundwater discharge such that there would be a net deficit in the aquifer volume or a lowering of the local groundwater table level (i.e., 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 or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in 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 or amount of surface runoff in a manner that 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 hazard delineation map?	☐	☐	☐	☒
h. Place within 100-year flood hazard area structures that 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. Cause inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

Significance criteria established by CEQA Guidelines, Appendix G.

5.9.1 Setting

The Proposed Project would be located in the San Francisco Bay Hydrologic Region of California, within the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB), and subject to management direction of the Water Quality Control Plan (Basin Plan) for the San Francisco Region. The Proposed Project would include onshore, offshore, and underground components, and the study area for hydrology and water quality therefore includes all onshore water resources, offshore water resources, and groundwater resources that could be affected by the project. The onshore portions of the project would be located in the urban environment of the San Francisco waterfront, while the offshore portions would be in the San Francisco Bay and San Francisco Bay Estuary. The area is underlain by the Downtown San Francisco Groundwater Basin. Onshore, offshore, and groundwater resources are described below.

Surface Waters, Onshore

All surface water features in the urban environment of the project area have been channelized to facilitate development and flood control. San Francisco is subdivided into several historical watersheds, each of which drains to a common part of the San Francisco Bay during wet weather. Embarcadero Substation is located in the Mission Creek Watershed, and Potrero Switchyard is located in the Islais Creek Watershed.

Mission Creek is completely channelized, routed between Potrero Switchyard and Embarcadero Substation, and draining eastward into China Basin. The Mission Creek Channel is a navigable tidal channel that is currently undergoing a restoration project to reestablish areas of wetland habitat and stabilize channel banks. Prior to channelization, Mission Creek received flows from artesian springs on Potrero Hill and tributaries originating on Twin Peaks, and emptied into Mission Bay, which existed as an estuary of combined salt and freshwater marshes, tidal mudflats, and shallow bay; as mentioned, the Mission Creek Channel now empties into China Basin. (p. 3.9-7 of PG&E, 2012

Islais Creek is also completely channelized, and the Islais Creek Channel is located approximately 2,500 feet south of the Potrero Switchyard. The Islais Creek Channel drains into the San Francisco Bay.

Surface Waters, Offshore

The San Francisco Bay Estuary is the largest estuary on the west coast of the United States, where fresh waters from California's Central Valley mix with the saline waters of the Pacific Ocean (SFB RWQCB, 2011). San Francisco Bay is relatively shallow and subject to high rates of sediment movement. Approximately 40 percent of the bay is less than six feet deep and about 70 percent is less than 16 feet deep. 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.

Water and Sediment Quality

As described above, the study area for hydrology and water quality includes both onshore and offshore waters, as well as groundwater resources. This section presents water and sediment quality data for both onshore and offshore surface water resources. Groundwater quality data is presented separately.

Table 5.9-1 provides an overview of surface waters in the project area that are currently listed as impaired on the Clean Water Act (CWA) Section 303(d) List for this region (the CWA is addressed in detail under "Applicable Regulations").

As noted above, water quality impairments in Mission Creek and Islais Creek are associated with sewer overflow and industrial point sources. Water quality impairments in the San Francisco Bay Estuary are also largely associated with industrial sources. The following table describes surface water impairments in the project area.

Table 5.9-1. Impaired Surface Waters in the Project Area

Water Body	Type of Impairments	Sources	Area Affected
Mission Creek	▪ *Suspended in Water*: Ammonia, Hydrogen Sulfide ▪ *In Sediments Only*: Chlordane, Dieldrin, Lead, Mercury, PAH, PCB, Silver, Zinc	Combined Sewer Overflow; Industrial Point Sources	8.5 acres
Islais Creek	▪ *Suspended in Water*: Ammonia, Hydrogen Sulfide ▪ *In Sediments Only*: Chlordane, Dieldrin, PAH, Sediment Toxicity	Combined Sewer Overflow; Industrial Point Sources	46 acres
San Francisco Bay, Central	Chlordane, DDT, Dieldrin, Dioxin Compounds (including 2, 3, 7, 8-TCCD), Exotic Species, Furan Compounds, Mercury, PCB, dioxin-like PCB, Selenium	Agriculture; Nonpoint Sources; Atmospheric Deposition; Ballast Water; Industrial and Municipal Point Sources; Natural Sources; Resource Extraction	70,992 acres

Notes:
PAH = Polycyclic Aromatic Hydrocarbons; PCB = Polychlorinated biphenyls.
The CWA Section 303(d) list does not differentiate sediment versus water contamination for the Central San Francisco Bay; water quality in the San Francisco Bay is also addressed in Table 5.9-2.
Source: SWRCB, 2006

As a condition of their discharge permit, most dischargers to the San Francisco Bay are required to participate in the Regional Monitoring Program (RMP), a data collection, research, and coordination effort administered by the San Francisco Estuary Institute (SFEI) (p. 3.9-8 of PG&E, 2012). Data collected for the RMP indicate that water quality impairments, concerns, and priorities in the San Francisco Bay Estuary include high concentrations of PCBs, as well as exceedances of water quality objectives in Central Bay waters, as indicated in Table 5.9-1. RMP data also indicate that water quality in the Central Bay, tends to be better than water quality in the North and South Bay areas (p. 3.9-8 of PG&E, 2012). Water quality data from the RMP Annual Monitoring Results for the Central Bay Region is presented in Table 5.9-2.

Table 5.9-2. Water Quality, San Francisco Bay, 2005-2010

	Concentration (µg/L)				
			Water Quality Objectives		
Constituent	Maximum Measured	Median Measured	4-Day Average	1-Hour Average	24-Hour Average
Arsenic	2.5	2.05	36	69	n/a
Cadmium	0.113	0.1	9.3	42	n/a
Copper	3.17	1.66	3.12	4.8[a]	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[b]	20.3	n/a
Silver	0.014	0.006	n/a	1.9	n/a
Zinc	4.19	2.24	81	90	n/a
PAH	0.042	0.028	n/a	n/a	15
PCB (Sum of 268)	0.000295	0.000222	n/a	n/a	n/a

Notes:
PAH = Polycyclic Aromatic Hydrocarbons; PCB = Polychlorinated biphenyls.
a - 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).
b - 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).
Source: p. 3.9-9 of PG&E, 2012.

The table above shows that measured concentrations of water quality constituents in the San Francisco Bay Estuary are within the identified Water Quality Objectives, with the exception of copper, which had a measured maximum concentration of 0.05 µg/L above the 4-day Average Objective.

The RMP Annual Monitoring Results for the Central Bay Region also reflect sediment impairments in the San Francisco Bay Estuary. Sediment quality data from the RMP Annual Monitoring Results for the Central Bay Region is presented below, in Table 5.9-3. This table shows measured concentrations of contaminants in bay sediments, in comparison to the National Oceanic and Atmospheric Administration (NOAA) sediment benchmarks termed Effects Range-Low (ERL) and Effects Range-Median (ERM).

Table 5.9-3. Sediment Quality, San Francisco Bay, 2005-2010

	Concentration (µg/L)			
			Screening Concentrations	
Constituent	Maximum Measured	Median Measured	ERL	ERM
Metals (mg/kg dw)				
Arsenic	18.30	9.94	8.2	70
Cadmium	0.34	0.21	1.2	9.6
Copper	43.89	36.35	34	270
Lead	33.20	20.09	46.7	218
Mercury	0.94	0.25	0.15	0.71
Nickel	86.9	73.8	20.9	51.6
Selenium	0.46	0.19	n/a	n/a
Silver	0.378	0.194	1.00	3.70
Zinc	129	97	150	410
PAH (Sum of 25)	43,047 (CB044S)	3,086	4.022	44,792
PBDE	9.3	2.08	n/a	n/a
PCB (Sum of 268)	21.8	9.5	22.7	180.0
DDTs (µg/kg dw)	13.3	2.8	1.58	46.1
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[1]	0.38	0.29	n/a	n/a

Notes:
1 - All data are from 2005-2010 except dioxin/furans data, which are from 2008-2010.
PAH = Polycyclic Aromatic Hydrocarbons; PBDE = Polybrominated Diphenyl Ethers; PCB = Polychlorinated biphenyls (µg/kg dw).
ERL = Effects Range-Low are levels that are indicative of concentrations below which adverse effects rarely occur.
ERM = Effects Range-Median are levels above which adverse effects frequently occur.
Units: mg/kg dw = milligrams per kilogram in dry weight; µg/kg dw = micrograms per kilogram in dry weight.
Source: p.3.9-10 of PG&E, 2012.

Sediment concentrations greater than the ERM are generally interpreted as an indication of contamination. The table above indicates that sediments in the Proposed Project area are affected by relatively high levels of mercury, nickel, and PAHs, as well as marginally high levels of arsenic, copper, and PCBs.

Flood Hazards

A 100-year floodplain is an area anticipated to be inundated by flows associated with the storm event of magnitude likely to occur once every one hundred years, or the storm with a one percent chance of occurring each year. The Federal Emergency Management Agency (FEMA) defines 100-year floodplains, also referred to as Special Flood Hazard Areas, on Flood Insurance Rate Maps (FIRMs) produced under the National Flood Insurance Program (NFIP), which the City of San Francisco participates in. FEMA issued a preliminary FIRM for the City of San Francisco in 2007, but this FIRM has yet to be finalized

(SFGov, 2011). In the meantime, the City Administrator's Office has created an Interim Floodplain Map in order to assess existing floodplain hazards in the area (SFGov, 2011). The Interim Floodplain Map is based on FEMA's preliminary FIRM, and shows that portions of the Proposed Project are located within a Special Flood Hazard Area (SFGov, 2008). Specifically, portions of the project's HDD segments cross through a Special Flood Hazard Area.

Flood hazards may also occur through the failure of a dam or levee, most likely associated with a strong seismic event. 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. (p. 3.9-9 of PG&E, 2012)

The potential for a tsunami event to occur also introduces flooding hazard. Portions of the proposed facilities, including the Potrero Switchyard, are located within a Tsunami Hazard Area identified by the California Emergency Management Agency (CEMA) (CEMA, 2013). Tsunamis are large waves in the ocean or other large water bodies generated by earthquakes, coastal or submarine landslides, or volcanoes. Tsunamis of the magnitude with potential to result in damage are not common on the California coast. The most devastating tsunami to affect California in recent history was from the magnitude 9.2 Alaskan earthquake of 1964 located in the Cascadia subduction zone. Areas of Northern California experienced a 6-meter (20-foot) tsunami wave that flooded low-lying communities, such as Crescent City, but the tsunami wave height only reached 1.1 meters (just over 3 feet) near San Francisco. A tsunami caused by a very large earthquake elsewhere on the Pacific Rim could also reach the California coast many hours after the earthquake. For example, the tsunami caused by the 2011 magnitude 9.0 Tohoku earthquake near Japan caused a sea level fluctuation at San Francisco's Marina District of 0.62 meters (about 2 feet; PG&E, 2013).

Most of the faults that can generate large tsunamis would result from earthquakes located several hundreds of miles away, and the ground motions generated from those sources would be generally very low to non-detectible in the project area. Crustal faults in the Bay Area, such as the San Andreas Fault, are unlikely to generate a significant tsunami. A repeat of the 1906 earthquake is expected to generate less than 10 cm (4 inches) of sea level disturbance (tsunami) based on an actual reading from the 1906 earthquake. Sea level disturbance inside of the Golden Gate Bridge is expected to be less than the 10 cm recorded at the Presidio. (PG&E, 2013)

Groundwater Resources

The project area is underlain by the Downtown San Francisco Groundwater Basin, which encompasses approximately 7,600 acres (12 square miles) of the northeast portion of the San Francisco peninsula. Recharge to this basin occurs from infiltration of rainfall, landscape irrigation, and leakage of water and sewer pipes, with approximately half of all recharge associated with leakage from municipal water and sewer pipes. A groundwater budget is not available for this basin, but little to no seasonal fluctuations in groundwater level trends suggest a stable budget. (DWR, 2004)

Due to this groundwater basin's location on the coast, and low ground elevations in the area, depth to groundwater is relatively shallow. Groundwater is estimated to occur between five and 20 feet below ground surface throughout the project area, and groundwater levels are likely tidally influenced (p. 3.9-9 of PG&E, 2012). Potential use of groundwater in this basin is limited to non-potable uses due to historic industrial development, high salinity, and density of contaminated sites (p. 3.9-9 of PG&E, 2012).

As discussed in Section 3.8 (Hazards and Hazardous Materials), potential contamination in soil and groundwater has been documented at several locations along the Proposed Project route (p. 3.9-9 of PG&E,

2012). Groundwater quality throughout the basin is affected by high concentrations of nitrates and elevated chloride, boron, and total dissolved solids (TDS). The high nitrate levels are attributable to recharge from sewer pipe leakage, and irrigation return flows, while elevated chloride and TDS levels are likely due to sewer pipe leakage, as well as historic and current seawater intrusion, and connate water, or water trapped in rock strata at the time for formation (DWR, 2004).

Applicable Regulations

Federal

Clean Water Act

The Federal Water Pollution Control Act was passed in 1972, and was amended in 1977 as the Clean Water Act (CWA, 33 U.S.C. 1251 1376). The CWA was reauthorized in 1981, 1987, and 2000, and establishes the basic structure for regulating discharges of pollutants into the waters of the United States and has given the U.S. Environmental Protection Agency (EPA) the authority to implement pollution control programs. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface waters. Many pollutants are regulated under the CWA, including various toxic pollutants, total suspended solids, biological oxygen demand and pH (acidity/alkalinity measure scale). Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process, described below under the "Section 402" discussion. The CWA generally applies to surface Waters of the United States, managed by the U.S. Army Corps of Engineers (USACE).

Section 401

Section (§) 401 of the CWA requires the State (via the nine RWQCBs) to issue Water Quality Certifications (WQC) for licenses or permits issued for, among other things, the discharge of dredged or fill materials to federally jurisdictional waters, or Waters of the United States, which are located within the State. In order for a §401 WQC to be required, the activity causing the discharge must be authorized by a permit or license issued by a federal agency; federal licenses and permits most frequently subject to §401 include CWA §402 (NPDES) permits issued by EPA, CWA §404 (dredge and fill) permits issued by the USACE, hydropower licenses issued by the Federal Energy Regulatory Commission (FERC), and Rivers and Harbors Act (RHA) §9 and §10 permits issued by the USACE (USEPA OWOW, 2010).

Dredging permit applicants intending to dispose of material in water must obtain a §401 WQC from the State of California through the applicable regional water board, in this case the San Francisco Bay RWQCB. After reviewing the project, the RWQCB may recommend to the SWRCB that certification be granted or denied. Dredged material considered for disposal in water must be tested to determine its suitability for disposal. Section 401 of the CWA provides authority to determine suitability of dredged material for water disposal to the State, via the RWWCBs. (PG&E, 2012)

Section 402

Section 402 of the CWA prohibits the discharge of pollutants from point sources to Waters of the United States, unless authorized under an NPDES permit issued by the United States Environmental Protection Agency (USEPA); one exception to this is the discharge of dredged or fill material, which is regulated under §404 of the CWA. In California, NPDES permitting authority is delegated by the USEPA to the State Water Resources Control Board (SWRCB) and administered by the nine RWQCBs. As mentioned above, the Proposed Project would be within the jurisdiction of the San Francisco Bay RWQCB (Region 2); any point-source discharges associated with the project would need to be permitted by the San Francisco Bay RWQCB.

Projects that disturb one or more acres and would result in discharge(s) to Waters of the U.S. are required to obtain NPDES coverage under the Construction General Permits. Coverage under the NPDES Construction General Permit (Order No. 2009-0009-DWQ; NPDES Permit No. CAS000002) may be obtained if the following requirements are met:

- Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies BMPs that will prevent all construction pollutants from contacting stormwater and with the intent of keeping all products of erosion from moving offsite into receiving waters;
- Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the nation; and
- Perform inspections of all BMPs.

NPDES coverage under the Construction General Permit also regulates non-stormwater discharges, such as those associated with dewatering of trenches or other excavations that would occur under the Proposed Project.

Section 404

Section 404 of the CWA establishes a permit program administered by the USACE, which regulates the discharge of dredged or fill material into federally jurisdictional waters, or Waters of the U.S. (including wetlands). 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*. Guidelines for implementation of this portion of the CWA are referred to as the §*404(b)(1) Guidelines* and were developed by the USEPA in conjunction with USACE (40 CFR Parts 230). The Guidelines allow the discharge of dredged or fill material into jurisdictional waters only if there is no practicable alternative that would have less adverse impacts.

Dredged material must be tested for quality prior to aquatic disposal, in order 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. Section 404 of the CWA defines testing requirements for compatibility of dredged material with disposal sites located in or potentially affecting inland waters, such as the San Francisco Bay. In addition, a §401 WQC is required for any §404 permit actions.

Section 303(d)

Section 303(d) of the CWA (CWA, 33 USC 1250, et seq., at 1313(d)) requires states to identify "impaired" waterbodies as those which do not meet water quality standards. States are required to compile this information in a list and submit the list to the USEPA for review and approval. This list is known as the §303(d) list of impaired waters. Table 5.9-1 provides an overview of surface waters in the project area that are currently listed as impaired on the 303(d) list for this region, including the San Francisco Bay. As required per §303(d) of the CWA, the State and Regional Water Quality Control Boards assess water quality data for California's waters every two years to determine if they contain pollutants at levels that exceed protective water quality criteria and standards. The most recent update of the 303(d) list occurred in 2010 and the revised list was approved by the USEPA in December 2011 (SWRCB, 2011); this updated list did not change impairments in the Proposed Project area.

As part of the 303(d) listing process, states are required to prioritize waters and watersheds for future development of Total Maximum Daily Load (TMDL) requirements. The SWRCB and RWQCBs have ongoing efforts to monitor and assess water quality, to prepare the §303(d) list, and to develop TMDL requirements. Within the San Francisco Bay Region, the current list identifies more than 270 impairments in 88 water bodies; RWQCB staff is currently developing programs to address more than 160 of these TMDL listings (SFB RWQCB, 2013). TMDL programs in the project area include efforts to address multiple constituents in the San Francisco Bay, including copper, mercury, nickel, and PCBs, as well as Diazinon (pesticides) in San Francisco Bay Area urban creeks (SFB RWQCB, 2013).

Dredged Materials Management Office

The Dredged Materials Management Office (DMMO) facilitates the processing of dredging permit applications within existing laws, regulations, and policies. 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 LTMS Program is described below, under "Local"). The DMMO is an interagency group that includes USEPA, USACE, California State Lands Commission (CSLC), BCDC, and California Department of Fish and Wildlife (CDFW). Participating agencies also include the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS), who provide advice and expertise to the process. This interagency group 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 the San Francisco Bay. The DMMO was specifically designed to provide a mechanism for consistent review of permit applications through coordinated efforts among the member agencies; no new regulatory statutes were initiated in the formation of the DMMO, and all applicable regulatory authority and processes of the member agencies remain in full force and effect.

Rivers and Harbors Act of 1899

The Rivers and Harbors Act of 1899 regulates development and use of the nation's navigable waterways, such as the San Francisco Bay. Navigable waters are defined as those subject to the ebb and flow of the tide and susceptible to use in their natural condition or by reasonable improvements as means to transport interstate or foreign commerce. Section 10 of the Rivers and Harbors Act prohibits the 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. (federally jurisdictional waters, or Waters of the U.S.). The Rivers and Harbors Act applies to any dredging or disposal of dredged materials, as well as excavation, filling, re-channelization, or any other modification of navigable water. Most activities covered under this act are also covered under §404 of the CWA.

Oil Pollution Act of 1990

The Oil Pollution Control Act (OPA) of 1990 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 the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), commonly known as Superfund, 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

The Ports and Waterways Safety Act, as amended by the Port and Tanker Safety Act of 1978, 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. The Ports and Waterways Safety Act authorizes Vessel Traffic Services, controls vessel movement, and establishes requirements for vessel operation and other related port safety controls. A number of other laws also call for USCG enforcement, including 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. In addition, 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, and the Marine Protection, Research and Sanctuaries Act of 1972 requires USCG surveillance of ocean dumping activities.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), a component of the U.S. Department of Homeland Security. The NFIP is a federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding. In support of the NFIP, FEMA identifies flood hazard areas throughout the U.S. and its territories by producing Flood Insurance Rate Maps (FIRMs). FIRMs identify the estimated limits of the 100-year floodplain for mapped water courses, among other flood hazards. A 100-year floodplain is defined as any land that would be inundated by the magnitude of flood that has a one percent chance of occurring in any given year (also referred to as the "base flood"). Participation in the NFIP is based on an agreement between communities and the federal government. The agreement states that if a community adopts and enforces a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the federal government will make flood insurance available to the community. Portions of the project area are located within FEMA-designated Flood Hazard Areas.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1967 (California Water Code §13000 et seq.) regulates surface water and groundwater within California and assigns responsibility for implementing CWA §401 through §402 and §303(d), discussed above, to the SWRCB and the nine RWQCBs. Porter-Cologne also established the SWRCB and divided the state into nine regions, each of which is overseen by a RWQCB, and requires that water quality criteria to protect State waters are developed for each of the nine regions and adopted in each region's Water Quality Control Plan, also referred to as the Basin Plan. In compliance with Porter-Cologne, each Basin Plan identifies beneficial uses for waters of the State within the Region, as well as narrative and numerical water quality standards, and procedures for implementing such standards.

For any project that would discharge waste (including fill) to waters of the State, the project applicant must file a report of waste discharge with the applicable RWQCB; this report serves as an application to the RWQCB for issuance of waste discharge requirements (WDRs) for the project, where WDRs function as a permit to control water quality degradation. The RWQCB may also issue a waiver of WDRs. No discharges to waters of the State may occur until the RWQCB has issued WDRs or a waiver of WDRs. As a water quality control permit, WDRs must implement Basin Plan requirements for water quality standards, taking into account the beneficial use(s) associated with affected water(s). (CERES, 2002)

WDRs are distinct from the Water Quality Certifications because they apply to waters of the State and are authorized per the California Porter-Cologne Water Quality Control Act, whereas Water Quality Certifications apply to Waters of the U.S. and are authorized per §401 of the federal CWA. The RWQCBs are responsible for issuing both types of permits. Where both federal and state waters would be affected, a §401 Water Quality Certification may be implemented to satisfy both federal and state laws. Where no federally jurisdictional waters (Waters of the U.S.) would be affected, a WDR per the Porter-Cologne Act may still be required to protect waters of the State.

The Proposed Project would be located within the San Francisco Bay Region and subject to the Basin Plan administered by the San Francisco Bay RWQCB. The San Francisco Bay Region is 4,603 square miles, predominately characterized by 1,100 square miles of the 1,600-square-mile San Francisco Bay Estuary, where fresh waters from California's Central Valley mix with the saline waters of the Pacific Ocean (SFB RWQCB, 2011). The Basin Plan for the San Francisco Bay Region was originally adopted in 1975, and has been revised numerous times since then; the current edition of the Basin Plan was adopted in 2011 (SFB RWQCB, 2011). In accordance with the Porter-Cologne Water Quality Control Act, the Basin Plan sets forth implementation policies, goals, and water management practices for the Region, and discharges to the surface waters in the region are subject to the regulatory standards set forth in the Basin Plan.

McAteer-Petris Act

The McAteer-Petris Act (Act) established the San Francisco Bay Conservation and Development Commission (BCDC) to manage planning and regulation of San Francisco Bay, emphasizing the elimination of unnecessary fill placement, the use of the bay for water-oriented uses, and the inclusion of public access in bay planning. The BCDC's jurisdiction includes all areas of the bay that are subject to tidal action, including sloughs and marshlands, as well as a 100-foot shoreline band surrounding the bay, saltponds and managed wetlands defined in the Act, and certain additional designated waterways. In accordance with the Act, permits must be obtained from the BCDC for the placement of fill, extraction of materials, and substantial changes in the use of land, water, or existing structures in the bay. In determining whether to issue permits, the BCDC considers policies identified in the Act and in the San Francisco Bay Plan. These policies generally authorize fill or excavation of wetlands only for water-dependent projects where no feasible upland alternatives exist, and only if wetlands impacts are mitigated. (CERES, 2012) The proposed submarine cable would be located within BCDC jurisdictional areas and would require an administrative permit by BCDC. Additionally, the USACE and RWQCB permit would be subject to a consistency determination from BCDC for dredging and disposal activity in San Francisco Bay.

Burton Act of 1968

In accordance with the Burton Act of 1968, the State of California transferred all responsibilities for the San Francisco waterfront to the City and County of San Francisco, and the Port Commission was created to manage the waterfront. The Port of San Francisco receives no financial support from the City and relies almost solely on the leasing of Port property for its revenues (SF Port, 2013). The Port Commission has jurisdiction over the Potrero Switchyard area, as well as the submarine cables and portions of the HDD, and the project requires a license by the San Francisco Port Commission.

Local

The CPUC has exclusive jurisdiction over siting, design, and construction of the Proposed Project, and the project is therefore not subject to local discretionary regulations. However, following is a summary of local regulations and regulatory agencies relating to hydrology and water quality, provided for informational purposes and to assist with the CEQA review.

San Francisco Public Works Code, Article 21

Article 21 of the San Francisco public Works Code restricts the use of potable water for soil compaction and dust control activities. Relevant sections are identified and summarized below.

- **Section 1101, Restriction of Use of Potable Water,** prohibits the use of potable water for soil compaction or dust control activities within the City and County of San Francisco, unless permission is obtained from the City Water Department.
- **Section 1103, Use of Non-potable Water**, stipulates that reclaimed water, well water, and groundwater must be transported and used in accordance with State Health Department, State Water Resources Control Board, Regional Water Quality Control Board, and City Departments of Health and Public Works orders, standards, and regulations.
- **Section 1104, Inspections and Stop Orders**, authorizes the Department of Public Works to inspect all construction and demolition sites in the City of San Francisco to determine compliance with this Article, and to stop the construction or demolition work when in violation of this Article.

San Francisco Bay Plan

The San Francisco Bay Plan (Plan) was first adopted by the BCDC in 1968, and has been amended periodically. The latest amendment was in 2010. The Plan is administered by the BCDC, which is authorized per the Plan to control both filling and dredging activities in the bay, as well as bay-related shoreline development (SFBCDC, 2010). According to the Plan, the 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 (p. 3.9-4 of PG&E, 2012).

Policies identified in the Plan that are applicable to the Proposed Project are listed below, as identified in the “Water Quality” section of the Plan.

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.*
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 Water Quality Control Plan, San Francisco Bay Basin, and should be protected from all harmful or potentially harmful pollutants.*
3) *New projects should be sited, designed, constructed and maintained to prevent or, if prevention is infeasible, to minimize the discharge of pollutants into the Bay by: (a) controlling pollutant sources at the project site; (b) using construction materials that contain nonpolluting materials; and (c) applying appropriate, accepted and effective best management practices, especially where water dispersion is poor and near shellfish beds and other significant biotic resources.*
4) *When approving a project in an area polluted with toxic or hazardous substances, the Commission should coordinate with appropriate local, state, and federal agencies to ensure that the project will not cause harm to the public, to Bay resources, or to the beneficial uses.*

San Francisco Waterfront Special Area Plan

The City and County of San Francisco, along with the Port and the BCDC, have adopted the San Francisco Waterfront Special Area Plan. The Special Area Plan divides the waterfront area into three geographic areas — Fisherman's Wharf, Northeastern Waterfront, and Southern Waterfront. The Special Area Plan also identifies both geographic-specific policies, applicable to the aforementioned areas, and general policies. The Proposed Project is located within the Northeastern Waterfront and Southern Waterfront areas. Both of these areas apply policies of the San Francisco Bay Plan, in greater specificity, as their geographic-specific policies. In the Northeastern Waterfront area, additional geographic-specific policies are identified to address using fill for public trust uses, and to guide the provision of public benefits and public access. (SFBCDC, 2010).

Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) Program

The LTMS Program was established in 1990 due to concerns regarding mounding of dredged material at the main disposal site near Alcatraz Island, and potential impacts from dredging and dredged material disposal to water quality, wildlife, and uses of the bay. The LTMS Program was established collectively by the BCDC, the San Francisco Bay RWQCB, the San Francisco District of the USACE, and the U.S. Environmental Protection Agency (EPA). In 2000, the LTMS agencies adopted the LTMS plan to reduce in-Bay disposal of dredged material and to maximize the beneficial reuse of dredged material. Beneficial reuse may include the following: construction of wetland restoration projects in areas that have been historically diked off from the bay and subsided; repair levees and flood control features in areas such as the Delta; and use as construction fill where appropriate. (SFBCDC, 2007)

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study.

Table 5.9-4. Applicant Proposed Measures (APMs) Related to Hydrology and Water Quality

APM Number	Issue Area
	Hydrology and Water Quality
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. 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 PEA 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	**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. *(Also see APM HM-1.)*

Table 5.9-4. Applicant Proposed Measures (APMs) Related to Hydrology and Water Quality

APM WQ-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. *(Also see APM HM-4.)*
APM WQ-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. *(Also see APM HM-5.)*
APM WQ-6	**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 PEA 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. *(Also see APM HM-6 and APM WQ-7.)*
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.

Table 5.9-4. Applicant Proposed Measures (APMs) Related to Hydrology and Water Quality

APM WQ-8	**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. *(Also see APM HM-7.)*
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.
APM WQ-10	**Sediment Monitoring and Response Plan.** Estimates of the amounts of material that may be suspended will vary depending on the specific type of equipment to be used. During final design, the expected equipment type will be identified and an evaluation can be made of the amount of sediment expected to be suspended. Along with the sediment quality information being gathered as described in APM WQ-8 and APM HM-7, this information will be used to determine, in coordination with the RWQCB, allowable thresholds of turbidity in the area of operations. A Sediment Monitoring and Response Plan will be developed in coordination with the RWQCB, taking into account equipment and the results of sediment sampling, that will set monitoring distance and methodology, acceptable thresholds of turbidity compared to background, and adaptive operational controls that will be used to reduce sediment suspension. These controls may include, but are not limited to, increasing or decreasing the speed of cable installation operation, increasing or decreasing the operational jet nozzle pressure, adjusting the operational angle of the jet nozzles on the burial blade, and other operational parameters that may reduce sediment suspension.

Table 5.9-4. Applicant Proposed Measures (APMs) Related to Hydrology and Water Quality

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), 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 PEA Section 3.9, Hydrology and Water Quality. ▪ Stopping work at that location and contacting the CUPA (SFDPH Environmental Health Section; see PEA 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 PEA Section 3.8.3.1), as well as the Maher Ordinance (see PEA Section 3.8.2.1).
APM HM-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 up, it will be removed and transported for disposal, according to applicable regulations.

Table 5.9-4. Applicant Proposed Measures (APMs) Related to Hydrology and Water Quality

APM HM-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	**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	**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.

5.9.2 Environmental Impacts and Mitigation Measures

To determine if implementation of the Proposed Project would result in potentially significant impacts to surface water or groundwater resources, the project was reviewed using the CEQA Guidelines Appendix G Environmental Checklist pertaining to “Hydrology and Water Quality.” Applicable federal, state, and local laws, ordinances, regulations, and standards and their policies or guidelines applicable to the project site and surrounding area were also reviewed.

a. Would the project violate any water quality standards or waste discharge requirements?

LESS THAN SIGNIFICANT. During construction and operation of the Proposed Project, there is potential for violations of water quality standards or waste discharge requirements to occur as a result of accidental leaks, spills, or releases of hazardous or potentially hazardous materials, and due to the encountering of existing contamination in the project area. Complying with applicable water quality standards, including obtaining and adhering to required water quality permits, would offer sufficient protection to avoid significant adverse impacts to water quality. Applicable water quality standards and regulations are described above, in Section 5.9.1. Adherence to these standards and regulations collectively ensures that a suite of best management practices would be applied to minimize the potential for an accidental release of hazardous materials to occur, to quickly and effectively address any such leak, and to quickly and effectively respond to any existing contamination encountered during construction. In addition, APMs WQ-1 and HM-1 would include implementation of a project-specific SWPPP and Hazardous Material and Emergency Response Procedures, respectively, which would further avoid adverse water quality effects. Potential water quality effects associated with both construction and operation of the project are described here along with the permitting requirements.

Permitting Requirements

Water quality standards and waste discharge requirements applicable to the Proposed Project are presented above in Section 5.9.1. The Proposed Project would be subject to multiple permits and approvals associated with the protection of water quality. The USACE is the responsible agency for regulating actions under CWA §404 and has the discretion to issue either case-by-case or general permits for potential effects to federally jurisdictional (Waters of the U.S.) inland waters, including the San Francisco Bay. Upon PG&E's filing for permit review, the USACE would make a CWA §404 determination; CWA §404 coverage may be obtained through compliance of the project with an existing Nationwide Permit (NWP), or through issuance by the USACE of an Individual Permit specific to the project. NWP coverage is offered by the USACE as a method of streamlining the permitting process, where each NWP addresses a category of impacts, and a project must meet certain General Conditions in order to achieve NWP coverage. The project is likely to gain CWA §404 coverage through compliance with an existing NWP, pending USACE review of the project and associated impacts.

If the USACE requires and issues a permit under CWA §404, then the project would also require a CWA §401 Water Quality Certification from the San Francisco Bay RWQCB. Onshore portions of the project would need to obtain NPDES coverage through implementation of a SWPPP, in order to comply with CWA §402. In addition to these regulatory requirements, APMs WQ-1 through WQ-3 would further ensure implementation of a project-specific SWPPP to avoid adverse water quality effects. The need for Waste Discharge Requirements to be issued by the RWQCB per the Porter-Cologne Act would likely be satisfied by requirements of the CWA §401 permit, although this determination must be made by the San Francisco RWQCB. In permitting the Proposed Project through issuance of a CWA §401 permit and/or WDRs, the RWQCB must consider waters identified as impaired on the CWA §303(d) list and must establish permitting requirements aimed to protect or improve the quality of §303(d)-listed waters.

Construction

The Proposed Project would construct a 3.5-mile-long transmission line Embarcadero Substation and Potrero Switchyard, including 0.6 miles to be installed underground in paved areas, 0.4 miles to be installed in horizontal directional drills (HDD) between the San Francisco Bay and onshore transition points, and 2.5 miles to be installed offshore in the San Francisco Bay. Each of these construction methodologies (underground, HDD, and offshore) are considered below, with their potential to result in adverse impacts to water quality such that water quality standards or waste discharge requirements could be violated.

Underground Transmission Line

Construction of the underground transmission line would include trenching and ground-disturbing activities that could potentially result in several different types of water quality effects, summarized below.

Erosion and Sedimentation. Ground-disturbing activities that would occur during project construction, including excavation of the trench for the underground transmission line, would have the potential to result in soil erosion (transport) and sedimentation (delivery) that could degrade water quality. This impact would be most likely to occur if a storm event occurs during construction activities, while disturbed areas are exposed and/or have not yet been re-paved.

APM WQ-1 (Development and Implementation of a Stormwater Pollution Prevention Plan (SWPPP)) would be implemented as part of the project design, and includes a suite of best management practices (BMPs) to minimize or avoid adverse water quality impacts associated with erosion and sedimentation such as the use of straw wattles, erosion control blankets, and silt fences, as appropriate. In accordance with SWRCB requirements, the SWPPP would be maintained and updated throughout the project's construction period. In addition, APM WQ-2 (Implementation of a Worker Environmental Awareness Program) would ensure that that all construction workers and field personnel associated with the project are appropriately trained on BMP implementation. Finally, APM WQ-9 (Project Site Restoration) would ensure that areas disturbed during project construction are appropriately restored following the completion of construction. Potential water quality effects associated with erosion and sedimentation would be less than significant.

Hazardous Materials. Hazardous or potentially hazardous materials such as vehicle and equipment fuel could leak or be accidentally released during construction activities. The accidental release of hazardous materials could result in water quality degradation along the transmission line route, or in downstream areas, if such materials are allowed to migrate to a drainage channel. Potentially hazardous materials that may be used during construction include but are not limited to the following: diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, lubricant grease, cement slurry, and other fluids required for the operation of construction vehicles and equipment. Motorized equipment used at the project site during construction could leak hazardous materials, such as motor oil, transmission fluid, or antifreeze, due to inadequate or improper maintenance, unnoticed or unrepaired damage, improper refueling, or operator error.

Drainages in the project area are completely channelized and maintained for flood control; project construction activities would not occur directly within local drainage channels. Indirect water quality contamination could occur if a potentially harmful or hazardous material is released and is subsequently transported through runoff during a storm event. APM WQ-1 specifies BMPs to address water quality effects associated with stormwater runoff, while APM WQ-2 ensures that BMPs would be appropriately implemented. In addition, APMs WQ-3 (Implementation of Hazardous Material and Emergency Response Procedures) and WQ-4 (Emergency Spill Supplies and Equipment), both of which are also included as part of the project design, would ensure that any accidental release or spill of hazardous materials is appropriately addressed according to applicable regulations, and that construction workers are trained on how to handle such situations. Adverse water quality effects associated with hazardous materials would be less than significant.

Shallow Groundwater. Groundwater in the project area is known to occur at shallow depths, and shallow groundwater could be encountered during ground-disturbing activities including trenching for installation of the underground transmission line. Where shallow groundwater is encountered during project construction, dewatering of the area would be conducted using a pump or well points; the water would be pumped into containment tanks and tested for impairments, then discharged into the local storm sewer system when the water meets quality standards (p. 2-36 of PG&E, 2012). If acceptable water quality standards are not reached for discharge into the existing system, the water would be disposed of in accordance with state and federal standards (p. 2-35 of PG&E, 2012). As described above for the Clean Water Act, the NPDES permit process and associated SWPPPs are executed in order to adhere to water quality standards regulated under the CWA, including those associated with various toxic pollutants, total suspended solids, biological oxygen demand and pH (acidity/alkalinity measure scale). Also as previously described, the Proposed Project would implement a customized SWPPP and would be in full compliance with water quality standards and regulations, including the CWA. Potential water quality impacts associated with shallow groundwater would be less than significant.

Existing Contamination. As described in Section 5.9.1, existing contamination is known to occur in the soil and groundwater in the project area; if areas of existing contamination are encountered during ground-disturbing activities associated with the underground transmission line, such contaminants could be mobilized into the environment. However, implementation of the project design APMs mentioned above identify BMPs to address stormwater runoff effects, which would also effectively avoid mobilization of contaminated areas potentially encountered during construction; these measures include APM WQ-1 (Development and Implementation of a SWPPP), APM WQ-3 (Implementation of Hazardous Material and Emergency Response Procedures), APM WQ-7 (Prevention of Contaminant Migration along HDD Route), and APM HM-1 (Implementation of Hazardous Material and Emergency Response Procedures).

In addition, APM WQ-5 (Soil Sampling / Wastewater and Groundwater Characterization) requires that soil sampling would be conducted prior to the onset of construction, and soil information would be provided to construction crews to inform them about soil conditions and potential hazards. Any hazardous materials encountered during project construction would be handled in accordance with applicable regulations. Soil borings conducted per APM WQ-5 would also identify where contaminated groundwater may be encountered, and dewatering activities would be applied as previously described. Potential water quality impacts associated with existing contamination would be less than significant.

Horizontal Directional Drilling (HDD)

HDD would be used to connect the onshore transmission line (installed underground, described above) and the offshore transmission line (installed beneath the floor of the San Francisco Bay Estuary, described below). On the land side, the HDD conduit would transition to duct bank conduits and into a transition manhole (p. 2-42 of PG&E, 2012). The offshore submarine cable would be pulled through the HDD conduits and spliced to a land cable type inside the transition manhole. The land cable type would then be routed to the substation within a duct bank system (p. 2-42 of PG&E, 2012). Several different types of water quality impacts could occur during this construction phase of the project, each of which is summarized below.

Erosion and Sedimentation*.* Similar to the erosion and sedimentation effects discussed above for the underground transmission line, ground-disturbing activities associated with HDD could result in water quality degradation from erosion and sedimentation. Ground-disturbing activities associated with HDD would include but are not necessarily limited to the following: excavate the HDD pits and insert the HDD rigs; drill the HDD bore holes; excavate an adjacent three-foot by five-foot pit at the exit of the bore hole to capture mud (which is pumped up to a barge and disposed of per appropriate regulations); and restoration of the area to pre-construction conditions. Silt fencing, erosion control, and containment devices would be implemented around the drilling equipment in order to prevent loose soils and stormwater runoff from leaving the site, as described in the Project Description, and as would be required by the Project's SWPPP, also described in APM WQ-1 (p. 2-42 of PG&E, 2012).

APM WQ-1 would ensure implementation of erosion control BMPs through a project-specific SWPPP, APM WQ-2 would ensure proper training of construction workers and field personnel, and APM WQ-9 would ensure that areas disturbed during project construction are appropriately restored. Potential water quality effects associated with erosion and sedimentation from HDD operations would be less than significant.

Hazardous Materials. Hazardous or potentially hazardous materials such as vehicle and equipment fuel could leak or be accidentally released during construction activities, as described above for the underground transmission line segment of the project. Onshore, visqueen (plastic sheeting) would be placed under the drill rig and any support equipment that could have a potential for a hydraulic, fuel, or oil leak (p. 2-42 of PG&E, 2012). In addition, HDD activity could impact bay water quality through loss of drilling fluids, and/or disruption of bay bottom sediments where the borehole emerges (disruption of bay sediments is addressed below, in the discussion of submarine cable installation).

HDD could also result in frac-out, which is when the ground fractures at the borehole location, allowing drilling fluid to escape to the surface; this situation may occur if the borehole becomes obstructed during drilling operations, or if pressure within the borehole is too great. The use of proper drilling techniques and careful monitoring of drilling operations should eliminate the potential for frac-out to occur. If frac-out were to occur in the bay, it is expected that drilling materials would remain at the frac-out location because they are denser than water, and therefore would not be able to rise to the surface or become suspended in waters of the bay. (p. 3.9-16 of PG&E, 2012)

APM WQ-6 (Horizontal Directional Drilling (HDD) Monitoring and Management) specifically addresses HDD activities, to ensure that appropriate BMPs are implemented to avoid potential adverse effects to water quality, including monitoring for loss of drilling fluids, spill containment measures, and spill response measures. In addition, APM WQ-7 (Prevention of Contaminant Migration along HDD Route) would further avoid impacts by preventing contaminants along the HDD route from leaching to the shoreline or the bay via the boreholes of the HDD. APMs WQ-3 and WQ-4 would also ensure that any accidental release or spill of hazardous materials is appropriately addressed. Potential impacts to water quality associated with hazardous materials and HDD operations would be less than significant.

Increased Turbidity. The Proposed Project would involve clamshell dredging activities to create HDD exit pits, using a clamshell dredger excavating from a work barge anchored above the exit points. The sides of the offshore pits would be sloped sufficiently such that shoring would not be necessary. Dredged material would be brought to the surface and deposited on/in a barge for disposal and/or reuse, depending upon the quality of the material. The action of excavating material from the floor of the bay and transferring it to the surface would likely result in temporarily increased turbidity and suspended sediments in the area.

APMs WQ-8 (Sediment Testing Program and Sediment Controls for Submarine Cable and Offshore HDD Intercept) and WQ-10 (Sediment Monitoring and Response Plan) would be implemented as part of the project design, in order to minimize adverse water quality effects associated with increased turbidity and sediment mobilization, as summarized below.

- APM WQ-8 ensures that PG&E would coordinate with the DMMO to develop a Sampling and Analysis Plan to assess the quality of sediments to be excavated. This APM requires that specific sediment testing, removal, handling, and disposal procedures are conducted in coordination with the DMMO, as well as a Dredge Material Reuse/Disposal authorization acquired from the DMMO.
- APM WQ-10 ensures that PG&E will coordinate with the RWQCB to identify allowable thresholds of turbidity in the project’s construction area. In addition, a Sediment Monitoring and Response Plan will be developed with the RWQCB, and will set monitoring distance and methodology, as well as adaptive operational controls that will be used to reduce sediment suspension.

Conclusion. With APMs WQ-8 and WQ-10 incorporated into the project design, potential water quality impacts associated with increased turbidity during HDD operations would be less than significant.

Submarine Cable Installation

The offshore portion of the Proposed Project would be constructed using hydroplow methods, where high-pressure water would be used to cut an approximately one-foot-wide trench where the transmission line would be buried. The submarine cables would be installed at a depth ranging between approximately 6 to 10 feet below the floor of the bay. In order to accomplish this, the hydroplow would be dragged along the bottom of the bay by a barge on the water's surface. The cable to be buried would be fed to the hydroplow by the barge and placed directly in the trench as the hydroplow forms it. Sediments displaced by the hydroplow become fluidized, and would largely fall back into the trench, on top of the cable. No additional disturbance would be required to bury the cable. Each of the three submarine cables would require one to 1.5 days for hydroplowing, as well as one day before and after the hydroplowing operations to mobilize and demobilize; therefore, hydroplowing operations for the entire project could conservatively require up to 10.5 days. Following is a discussion of potential water quality impacts that could occur as a result of hydroplowing activities.

Hazardous Materials. As with other construction activities, hydroplowing would include the use of hazardous materials required to operate construction equipment and machinery. The types of equipment and machinery to be used during hydroplowing are commonly used in the bay, and would not introduce new or unusual hazardous materials to the area. Compliance with CWA §401 would ensure that appropriate BMPs are implemented to protect water quality from hazardous materials effects. In addition, APMs WQ-1 through WQ-4 require the implementation of BMPs to avoid adverse water quality effects, including as related to the accidental release of hazardous materials.

Increased Turbidity. Hydroplow operations would cause localized increases in turbidity, or the concentration of suspended solids in the water. This disturbance may be comparable to the effects of common bay activities on increased turbidity, such as shallow-water vessel operation or minor dredging activities. Disturbance of sediments is not unusual in the bay. Turbidity is limited by controlling the pressure of the jets and the rate of hydroplow advancement, with the hydroplow instrumented to enable measurement and control of pressure. Increased turbidity associated with hydroplow operations is estimated to disperse within approximately 15 feet. In addition, the Sediment Monitoring and Response Plan required per APM WQ-10 would ensure coordination between PG&E and the San Francisco Bay RWQCB to set monitoring distances and methodologies, as well as to set adaptive operational controls for turbidity. As stated in Section 3.3.19 (Turbidity) of Chapter 3 (Water Quality Objectives) of the Water Quality Control Plan for the San Francisco Bay Basin, which is administered by the RWQCB, waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses, and increases from normal background light penetration or turbidity relatable to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU (SFB RWQCB, 2011). Coordination with the RWQCB and implementation of the Sediment Monitoring and Response Plan ensure that potential impacts to water quality associated with turbidity from the submarine cable installation would be less than significant.

Mobilization of Contaminants. The Proposed Project would be installed in the sediment on the floor of the bay, which could mobilize contaminants from the sediment to the water column. As discussed in Section 5.9.1 and shown in Table 5.9-3, sediments in the bay are affected by existing contamination, primarily in the form of PAHs, metals, and pesticides. Known areas of sediment contamination are located along the proposed route for the submarine cables. Most notably, the total concentration of PAHs is well above the probable effects level at the closest Regional Monitoring Program site, and above threshold effects levels at sites to the north and south of the project. Mercury concentrations have also been measured at very high levels in the project area, and high PCB concentrations have been measured throughout the bay.

The disturbance of sediments during hydroplowing operations would result in re-suspension of both sediment and contaminants in the water column. Sediment contamination is known to be more concentrated in shallower waters, where urban runoff is more concentrated. Sediments in the bay are also dynamic, and mobilize in response to human activities such as dredging and vessel operation, as well as natural conditions such as winter storms. However, if hydroplowing operations mobilize existing contaminants in bay sediments, adverse water quality effects could occur. Hydroplowing would not increase the concentrations of toxic pollutants in sediments of the bay, but may result in temporary increases in the concentration of toxic pollutants in the water column along the 2.5-mile offshore route, due to the re-suspension of contaminated sediments (if contaminated sediments are located along the cable alignments). This increased concentration could indirectly affect aquatic life, if ingested by species in the water. Most aquatic life in the project area would be expected to move away from the area of hydroplowing operations, and would not be adversely affected by the immediate disturbance. If species move back into the project area before re-suspended contaminated sediments have settled again, they may be exposed to increased concentrations of local contaminants. Section 5.4, Biological Resources, discusses potential impacts to marine life.

The Basin Plan for the San Francisco Bay Region stipulates (Section 3.3.12), "Controllable water quality factors shall not cause a detrimental increase in the concentrations of toxic pollutants in sediments or aquatic life," and "[t]he suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses" (SFB RWQCB, 2011). The San Francisco Bay RWQCB is responsible for implementing the Basin Plan, as well as for issuing Water Quality Certification permits per CWA §401 of the Clean Water Act and Waste Discharge Requirement permits per the Porter-Cologne Water Quality Control Act. As previously mentioned, the RWQCB permitting process would establish compliance with CWA §401 requirements, which would include the Waste Discharge Requirement permit. The RWQCB would ensure through its permit requirements that the Proposed Project would be consistent with the Basin Plan.

In order to minimize adverse water quality effects associated with the mobilization of contaminated sediments, APM WQ-8 would be implemented as part of the project design. In accordance with this APM, PG&E would work in coordination with the DMMO to develop a Sampling and Analysis Plan to assess the quality of sediments along the specific cable routes, and to conduct surveys to examine water depth, slopes, sediment types, potential contaminants, and any other activities or obstacles along the cable routes; these actions would occur regardless of any minor alignment modifications incorporated during the final design and engineering process. As described above, the DMMO was created as part of the LTMS Program, and is comprised of multiple resource agencies that work together to facilitate the processing of dredging permit applications within existing laws, regulations, and policies. In requiring the collaborative development of a Sediment Testing Program with the DMMO, APM WQ-8 would ensure that temporary water quality impacts associated with mobilizing contaminated sediments during hydroplowing activities would be less than significant.

Conclusion. The APMs discussed above and presented in Table 5.9-4 would be implemented as part of the project design in association with all applicable construction activities, including the Potrero Switchyard improvements. Construction of the Proposed Project would not result in significant water quality impacts, and would be in compliance with all applicable water quality standards and waste discharge requirements.

Operation and Maintenance

In accordance with APM WQ-9, the project area would be restored following the completion of construction. Monitoring of the Proposed Project facilities would largely be conducted using the existing PG&E computer system by a telecommunication circuit. Regular inspection of project facilities and infrastructure would be conducted, and repairs to project facilities would be conducted on an as-needed basis. Harmful or potentially hazardous materials including vehicle fuels and lubricants would be used for standard operation and maintenance practices. Adverse impacts to water quality could occur if such materials are accidentally spilled or leaked along the project route. If not properly addressed and cleaned up, a spill or leak of hazardous materials could wash into nearby drainages or infiltrate soil to the water table. However, as part of the project design, PG&E would prepare a Spill Prevention, Control, and Countermeasure (SPCC), and/or modify existing SPCC plan(s) applicable to the project, and such plan or modifications would include engineering and operational methods for preventing, containing, and controlling potential releases, as well as provisions for quick and safe cleanup. The existing SPCC oil containment basin and stormwater collection facilities at the Potrero 115 kV Switchyard (near the intersection of Illinois and 23rd Streets) would be used to the extent feasible. Storm water transport would be either by gravity flow (surface or piped), or pumping may be required depending on final hydraulic design. Provisions for oil/water separation and small amounts of additional temporary water storage (500 to 1,000 gallons) may be installed for water transference from the new 230 kV switchyard to the existing stormwater collection system. Potential impacts to water quality during operation and maintenance of the project would be less than significant, and the project would be consistent with all applicable water quality standards and waste discharge requirements.

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 (i.e., 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)?

LESS THAN SIGNIFICANT. Groundwater supplies could be adversely affected through any of the following means: direct consumption of groundwater resources; indirect depletion of groundwater supplies such as conducting dewatering activities where the water is not returned to the subsurface; and/or introduce substantial new impervious areas or increased soil compaction such that the rate of infiltration of stormwater runoff to the subsurface is substantially affected. Each of these potential circumstances is discussed below.

Water Supply Source

The Proposed Project would require a water supply of approximately two 2,000 gallon truckloads per day for dust control during construction, prior to and during ground-disturbing activities. For instance, storage piles would be kept wet and/or treated with a chemical dust suppressant; also, equipment would be washed down prior to moving from the work area onto public roads, and “wet sweeping” would be used to clean visible track-outs from the paved public roads. PG&E proposes no specific water source for these uses, but the water supply in the project area is provided by the San Francisco Public Utilities Commission (SFPUC). PG&E would be likely to obtain water supply services for the Proposed Project through coordination with the SFPUC. Consistent with Ordinance 175-91, enacted by the City and County of San Francisco in 1991, PG&E would use non-potable water for dust control and soil compaction activities where feasible. Local groundwater resources in the Downtown San Francisco Groundwater Basin are generally limited to non-potable uses due to historic industrial development, high salinity, and density of contaminated sites (p. 3.9-9 of PG&E, 2012). Although a groundwater budget for this basin is not currently available, the amount of water in storage is generally considered to be stable. Recycled water would likely be obtained from the SFPUC. Water supply requirements associated with the Proposed Project would be short-term and temporary, limited to the project's construction period. As such, the Proposed Project would not substantially deplete groundwater supplies as a result of water supply requirements.

Dewatering Activities

Due to the relatively shallow depth to groundwater in the project area, and the proposed trenching and excavation activities that would occur during implementation of the underground transmission line and HDD operations, it is likely that groundwater would be encountered during construction activities. If this occurs, dewatering activities would be implemented and; the water would be pumped into containment tanks and tested for impairments, then discharged into the local storm sewer system when the water meets quality standards, previously discussed (p. 2-36 of PG&E, 2012). If acceptable water quality standards are not reached for discharge into the existing system, the water would be disposed of in accordance with state and federal standards (p. 2-36 of PG&E, 2012). As such, groundwater that is removed from the subsurface during dewatering operations may not be returned to the subsurface. However, as described in Section 5.9.1, approximately half of all recharge to the Downtown San Francisco Groundwater Basin occurs through leakage from municipal water and sewer pipes; this recharge occurs regardless of project-related dewatering activities, and the project would not substantially deplete groundwater supplies as a result of dewatering.

New Impervious Areas / Increased Soil Compaction

Components of the Proposed Project with the potential to result in new impervious areas and increased soil compaction are restricted to onshore project features, including the underground transmission line segment, onshore HDD work areas, and improvements at the Potrero Switchyard. The underground portions of the transmission line would be routed under existing streets where soil has been historically disturbed, compacted, and paved. Soil in the vicinity of the trench would not be significantly modified from that already underlying the streets. Regarding the HDD work areas, project construction would introduce new impervious areas, but such areas would be temporary with metal plates covering any excavated areas outside of construction hours. Construction would also increase soil compaction across the work area sites due to the use of heavy equipment and machinery. However, new impervious areas would be temporary in nature, limited to the construction period, and in accordance with APM WQ-9, project work areas would be restored following the completion of construction. Improvements at the Potrero Switchyard would also introduce new impervious area and increased soil compaction, with provisions for stormwater mitigation or control (such as pervious pavement, detention, and/or landscaping) depending on City building code requirements. The effects would be site-specific and restricted to the boundary of the new switchyard area. Considering the urbanized nature of the surrounding area, and the fact that surface water infiltration only provides a fraction of recharge to the Downtown San Francisco Groundwater Basin, which receives most of its recharge from leaking underground municipal water and sewer pipes, improvements at the Potrero Switchyard would not adversely affect groundwater recharge or aquifer volume.

Conclusion. The Proposed Project would not 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; impacts to groundwater resources would be less than significant.

c. *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, in a manner, which would result in substantial erosion or siltation on or off site?*

LESS THAN SIGNIFICANT. The project would not alter the course of a stream or river. Increases in the rate or amount of surface water runoff could occur if the project introduces substantial new areas of impervious surfaces, if the project results in substantially increased soil compaction, and/or if the project results in new discharge of runoff water to the ground surface. Onshore ground-disturbing activities associated with the project would occur in previously disturbed areas that are predominately paved. As discussed in the Biological Resources section, a number of trees would be removed with the Project; no other vegetation removal would occur due to the project, and the project would not introduce substantial new areas of impervious surfaces. As described above, the project would result in minimal new impervious areas and increased soil compaction. The project may result in the discharge of dewatered groundwater to the existing stormwater system, but would not discharge runoff water to the ground surface. APM WQ-1 includes implementation of project-specific BMPs to minimize or avoid adverse effects associated with stormwater runoff and drainage pattern alterations. The project would not introduce drainage pattern alterations that would result in substantial erosion or siltation, on- or off-site, and potential impacts would be less than significant.

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 or amount of surface runoff in a manner that would result in flooding on or off site?*

LESS THAN SIGNIFICANT. As described above, the Proposed Project would not alter the course of a stream or river, and would not substantially alter the existing drainage pattern of the site or area. The project could increase the rate or amount of surface runoff associated with site-specific increases in impervious areas and soil compaction at the new Potrero Switchyard, but such effects would be temporary and highly site-specific, and would be minimized or avoided through implementation of BMPs required per APMs included as part of the project design, such as the SWPPP that would be developed per APM WQ-1. The Proposed Project would not substantially alter existing drainage patterns, and potential effects associated with flooding on- or off-site would be less than significant.

e. *Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems to provide substantial additional sources of polluted runoff?*

LESS THAN SIGNIFICANT. This significance criterion addresses two potential issues: the capacity of stormwater drainage systems, and the quality of stormwater runoff from the project area. As discussed under previous significance criteria, groundwater encountered during installation of the underground portion of the proposed transmission line would be dewatered and stored in containment vessels (Baker tanks) until it is determined whether the water quality would permit discharge to the City's combined sewer system, or whether the water would need to be trucked to an appropriate disposal facility. Water would be disposed of in accordance with state and federal standards. Stormwater collected at the proposed Potrero 230 kV Switchyard would be either transferred by pumped pressure piping or gravity flow (surface or piped, implemented during the Project construction period) to the existing 115 kV switchyard SPCC oil containment basin (near the intersection of Illinois and 23rd Streets), or after provisions for oil/water separation, directly into the stormwater collection system at the new 230 kV switchyard. Small amounts of additional temporary water storage (500 to 1,000 gallons) may be used as part of the water transference system from the new 230 kV switchyard to the existing 115 kV switchyard area. Final design of the temporary water storage would be dependent on the results of the geotechnical investigation and possible chemical analysis of the site soil. No runoff water would be contributed by the project such that the capacity of existing or planned stormwater drainage systems would be exceeded. With regards to the project's potential to provide a source of polluted runoff, water quality considerations are discussed under significance criterion (a), and have been determined to be less than significant. Potential impacts of the project associated with the contribution of excess runoff water and/or polluted runoff would be less than significant.

f. Would the project otherwise substantially degrade water quality?

NO IMPACT. All potential water quality impacts associated with the Proposed Project are captured in the impact discussions provided above.

g. Would the project place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

NO IMPACT. The project does not include construction of any housing units, and would not alter existing flood hazards in the area such that existing housing units would be placed within a 100-year floodplain. No impact would occur.

h. Would the project place within a 100-year floodplain structures that would impede or redirect flood flows?

NO IMPACT. Portions of the project's HDD segments cross through a FEMA-designated Special Flood Hazard Area. As previously described, HDD components are installed underground, to connect offshore facilities with onshore facilities. These components do not include any structures with the potential to impede or redirect flood flows in the 100-year floodplain.

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 Proposed Project would not alter any existing flood-related hazards in the area, and would not expose people or structures to a significant risk of loss, injury, or death associated with flooding. The project would have no potential to cause the failure of a levee or dam, and would not introduce associated flooding hazards. No impact would occur.

j. Would the project cause inundation by seiche, tsunami, or mudflow?

LESS THAN SIGNIFICANT. The Proposed Project is not located within proximity of a standing body of water that could produce a seiche in response to a strong seismic event, and is located in a relatively flat area not subject to mudflow hazards; therefore, the project would have no potential to cause inundation by seiche or mudflow.

Earthquakes off the California coast south of Cape Mendocino are mainly on strike-slip faults, including the San Andreas Fault in the project area. The lateral fault movements of strike-slip faults do not create the vertical offsets that cause tsunamis. Therefore, the crustal faults in the Bay Area that are more likely to damage the existing transmission system would rarely generate significant tsunamis, because water overlying the ocean floor is not likely to be thrust upward or dropped downward (PG&E, 2013).

However, earthquakes from the subduction zone off the California, Oregon, and Washington coast could generate tsunamis that reach California's coastline. Portions of the proposed facilities, including the Potrero Switchyard, are located within a Tsunami Hazard Area identified by CEMA (CEMA, 2013). Therefore, project facilities would be subject to inundation by a tsunami, should a strong seismic event occur and trigger a tsunami event in the ocean. However, implementation of the project would not alter existing potential for inundation by tsunami, and would introduce facilities that are consistent with existing infrastructure and facilities in the project area. If a tsunami event does occur after implementation of the project, the presence of the project would not alter the potential of such an event to result in adverse effects. Therefore, potential for the project to cause adverse effects associated with inundation by a tsunami would be less than significant.

5.10 Land Use and Planning

LAND USE 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?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

5.10.1 Setting

The Proposed Project would be located entirely in the City and County of San Francisco between the Embarcadero Substation at the corner of Fremont and Folsom Streets and the Potrero Switchyard on 23rd Street at Illinois Street. The project route would be primarily underground in paved city streets and offshore in the San Francisco Bay. The project location is shown in Figure 4-1 and 4-2 in Section 4 (Project Description).

The segment of the project from Embarcadero Substation to the bay would be located underground travelling east along Folsom Street to Spear Street, then south on Spear Street to the cul-de-sac just past the Bay Bridge (PG&E, 2012a, p. 3.10-4). This portion of the Proposed Project would be located in franchise (public right-of-way [ROW]) in city streets or in PG&E-owned property. Near the end of Spear Street the project would transition to the bay via horizontal directional drilling (HDD), also within franchise in city streets and areas owned by Caltrans (for the portion under the Bay Bridge) (PG&E, 2012a pg. 2-33). Land uses along Folsom Street include commercial and residential uses, apartment and condominium towers, parking lots and the Transbay Temporary Terminal, see Table 5.10-1 for land uses and zoning along the Proposed Project route and Figure 5.10-1 and 5.10-2 at the end of this section. The Transbay Temporary Terminal is located on the west side of Folsom Street between Main and Beale Streets and will be at this location until completions of the new Transbay Terminal scheduled for 2017. The Marin Day School Hills Plaza Campus is located at the corner of Spear and Harrison.

The Proposed Project would cross under The Embarcadero into the bay between Pier 28 and Pier 30/32 which house two restaurants, Hi Dive and Red’s Java House, respectively. Pier 30/32 is used as an overflow location for cruise ships (PG&E, 2012a, p. 3.10-4).

After the line transitions to the bay, it runs more than a quarter-mile offshore, past the marina at Pier 40 and the San Francisco Giants ballpark, and returns to land at 23rd Street. PG&E proposes to obtain a license from the Port for use of Port property (PG&E, 2012a, p. 2-34). This portion of the bay does not include anchoring areas and is inland from the shipping lanes and existing Trans Bay Cable, see Section 5.16, Transportation and Traffic.

After returning to land, the project runs along 23rd Street to the new 230 kV Potrero Switchyard on property owned by GenOn Energy, Inc. and part of the former Potrero Power Plant site. Adjacent land uses include commercial facilities, a storage facility, and the Trans Bay Cable facility. Two sections of the cable along the southern line would be located in private property, 760-feet in the DHL property and a second 100-foot long portion connecting the proposed Potrero Switchyard to the cable in franchise (public ROW) in 23rd Street (PG&E, 2012a, pp. 2-33 and 2-34). A Temporary Construction Easement 50-feet wide and a permanent 30-feet wide easement would be acquired from the private property owner beyond the DHL gate.

Schools within 0.25 miles of the project alignment include the Marin Day School at 2 Harrison Street, the Bright Horizons/Marin Day School Hills Plaza Campus, a private day care center, at 220 Spear Street, and the Youth Chance High School in the YMCA building at 169 Stuart Street.

Table 5.10-1. 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	RH DTR – Rincon Hill Downtown Residential 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 ▪ Transbay Temporary 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

Table 5.10-1. Zoning and Land Use Adjacent to Proposed Facilities Embarcadero-Potrero 230 kV Transmission Project

Project Location	Zoning[1]	Existing Land Use
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

Source: City of San Francisco, 2012a; PG&E, 2012a.
1 - Zoning Map of the City and County of San Francisco; incorporates Board of Supervisor ordinances enacted through April 2012.

Regulatory Setting

Federal

Coastal Zone Management Act. The authority to evaluate projects conducted, funded, or permitted by the federal government in the coastal zone is granted to coastal states through the federal Coastal Zone Management Act (CZMA) of 1972, United States Code (U.S.C.) Title 16, Sections 1451 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 Proposed Project would 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 5.4, Biological Resources, and Section 5.9, Hydrology, and are listed in Table 4-6 in Section 4.14 (Other Permits and Approvals). The USACE is required to obtain a consistency determination from the San Francisco Bay Conservation and Development Commission (BCDC) to confirm that the Proposed 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

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 (PG&E, 2012a). 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 (amended January 2012) (BCDC and MTC, 2012).

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. PG&E is operating under the understanding that all offshore portions of the project are within Port jurisdiction (PG&E, 2012a; Brian Bugsch, letter to PG&E, 2012). The Port's responsibilities include promoting commerce, navigation, and fisheries; water-related recreation, habitat preservation, and open space. 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 (PG&E, 2012a). A Port license would be required for portions of the project that would be located on Port property including 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.

California Department of Education Power Line Setback Exemption Guidance, May 2006. Title 5, California Code of Regulations, Division 1, Chapter 13, Subchapter 1, § 14010 provides standards for school site selection. Section 14010(c) sets a 150 foot distance from the edge of a school site to the edge of a 220-230 kV easement. The California Department of Education Power Line Setback Exemption Guidance notes that setbacks for existing underground transmission line easements would be 25 percent of that stated in the *Title 5* setbacks, specifically 37.5 feet from the easement for 220-230 kV lines (California Department of Education, 2006).

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 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).

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 Plan would widen sidewalks and narrow and remove lanes where feasible on Harrison, First and Fremont Streets.

The 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 would 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 HDD portion of the northern submarine cable landing would 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, 2008), 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. 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 would be 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, 2008).

The Bay Trail Plan, adopted by the Association of Bay Area Governments (ABAG), describes a 500-mile-long trail that encircles the bay (ABAG, 1999). It was designed to have continuous waterfront access unless the shoreline location clearly conflicts with active maritime use. The project would 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 would not intersect the Bay Trail.

The Eastern Neighborhoods Streets and Open Space Concept Map (adopted December 2008) is included in the Central Waterfront Area Plan. 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.

Other Plans and Policies

San Francisco Bay Conservation and Development Commission. The buried submarine cable and the HDD segments of the project would be located in BCDC jurisdiction in the bay. The cable would cross the 100-foot shoreline band underground, and the transition areas and vaults would be located outside the 100-foot shoreline band. BCDC defines priority uses for the San Francisco Bay shoreline through the San Francisco Bay Plan. 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.

Policy 5 of Part IV, Other Uses of the Bay and Shoreline, states the following:

> *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. High voltage transmission lines should be placed underground as soon as this is technically and economically feasible.* (BCDC, 2005).

San Francisco Waterfront Special Area Plan. The submarine cable would traverse 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 the 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 (BCDC, 2010, Map 4). The portion of Pier 70 planning area affected by the project is not designated for any priority use (BCDC, 2010, Map 6).

There are three applicable waterfront developments mentioned in the San Francisco Bay Plan:

- **Brannan Street Wharf Open 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 (PG&E, 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 would 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 (PG&E, 2012a). 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 would be located approximately a quarter-mile from the future Brannan Street 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.

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 would be installed deep enough such that no port priority uses would be affected (PG&E, 2012a).

San Francisco General Plan Recreation and Open Space Element. The Recreation and Open Space Element Policy 2.8 is to "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 states that the Bay Trail should traverse the eastern edge of San Francisco and link waterfront parks and open spaces including improved access to Warm Water Cove located at the east end of 24th Street.

Policy 3.5 states that

> *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 would cross under the proposed shoreline access from the north to Warm Water Cove in front of the former Potrero Power Plant owned by GenOn.

Port of San Francisco Waterfront Land Use Plan. The Waterfront Land Use Plan identifies areas where public access to the waterfront should be enhanced. 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.

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 (PG&E, 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 would pass under The Embarcadero to the north of the Bryant Street Mixed Use Opportunity Area. In addition, the project would 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 would not dredge within five vertical feet of the HDD conduits. As part of that agreement, PG&E would put the HDD as near to the bedrock surface as possible to allow dredging.

All project facilities would 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 would be located outside of the planning area for Pier 70 and the cable would 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.

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study (see Table 5.10-2).

Table 5.10-2. Applicant Proposed Measures (APMs) Related to Land Use and Planning

APM Number	Issue Area
	Land Use and Planning
APM 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.

5.10.2 Environmental Impacts and Mitigation Measures

a. Would the project physically divide an established community?

NO IMPACT. The Proposed Project would be located underground in existing street ROW, under The Embarcadero, or in the bay. Construction of the Potrero Switchyard would be adjacent to the existing 115 kV switchyard on a parcel owned by GenOn Energy, Inc. PG&E would need to acquire this property through a fee simple transaction or condemn the property for utility use. No facilities would divide an established community.

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?

LESS THAN SIGNIFICANT. Residential, commercial, and industrial uses located along Folsom, Spear, and The Embarcadero in the north and 23rd Street in the south would be affected by temporary impacts associated with construction including noise, dust, odors, pedestrian and vehicle access restrictions, and increased traffic during HDD activities and in-street trenching. The Proposed Project would be adjacent to the Bright Horizons/Marin Day School at Hills Plaza, and adjacent to residential uses along Folsom and Spear Streets, where in-street trenching is proposed. Trenching would progress at an approximate rate of 50 feet per day, and approximately 150 feet to 300 feet of trench would be open at any one time. Within the four month period of trench excavation and manhole installation along Folsom and Spear Streets, trenching within 100 feet of any single location would be limited in duration to about four days as crews would gradually move along the linear work zone. The total duration of trench excavation and manhole installation for the northern underground segment is estimated to take approximately four months and two months for the southern underground segment. In addition, HDD activities would take six to seven weeks for each HDD transition. The Marin Day School–Hills Plaza is located approximately 200 feet from the proposed HDD transition area, and the street-level Harbor Lofts at 400 Spear Street would be approximately 25 feet from the nearest edge of the HDD transition. Temporary construction impacts from dust and odors are addressed in Section 5.3, and noise impacts are analyzed in Section 5.12; impacts to air quality and noise would be less than significant with mitigation. Traffic impacts are analyzed in Section 5.16 and would be less than significant. AMP LU-1 would require PG&E to provide the public with advance notification of construction activities, between two and four weeks prior to construction and AMP LU-2 would require PG&E to 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. Because the impacts to existing land uses would be short-term in nature and because PG&E would provide advanced notification to the public and provide a public liaison to respond to concerns raised by neighboring residents, impacts would be less than significant.

Marin Day School–Hills Plaza. The proposed underground transmission line would be placed in the street adjacent to this day care facility. At this location, the duct bank centerline would be about 25 feet or more away from the day care facility property line. Under PG&E's design guidelines for the project, the conductors for the transmission line would be placed in the right-of-way at the greatest possible distance from the day care, except where the location of existing underground utilities prevent strategic line placement (see Section 4.15.3). Although policies regarding school sites would not be directly applicable to this project, the distance from the transmission line to the day care center property line could be less than the easement setback of 37.5 feet for 220-230 kV underground lines recommended by the California Department of Education for school sites near underground utility lines.

Rincon Hill. On the northern end of the project, the underground cable would be installed in Spear and Folsom Streets in the Rincon Hill planning area. Placement of the cable in city streets would not adversely affect future development of the neighborhood as a mixed-use downtown neighborhood. All construction activities required to connect the new 230 kV cable to the existing Embarcadero Substation would occur within city streets and existing PG&E property boundaries and construction associated with the underground cable would be short term in nature, see expected construction duration above. There would be no effect to existing or planned land use associated with the project. Access to residences and businesses would be maintained during construction through temporary plating or night construction as determined in coordination with the City. Furthermore, Mitigation Measure N-2 would ensure that PG&E obtains the special permit from the Director of Public Works or Building Inspection in anticipation of 24-hour HDD activity.

San Francisco Waterfront Special Area Plan. In the Waterfront area, project facilities would include a buried cable passing north of Pier 30/32 and under The Embarcadero. The submarine cable would 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. Installation of the cable via HDD north of Pier 30/32 would not affect redevelopment or use of the pier, nor would it affect the Port's ability to develop the Bryant Street Mixed Use Opportunity Area because the project infrastructure would be located below the ground surface. According to Port staff, Piers 30/32 are currently used as an overflow location for cruise ships, and the Port periodically dredges to 40 feet in the area (PG&E, 2012a). PG&E is working with the Port to ensure the cable would be drilled or buried deeply enough within Berth 30 and in the rest of the route to avoid obstructing future dredging activities or berthing vessels. The submarine cable would require a license from the Port.

The HDD rig and staging area on the northern segment of the transmission cable would be located along Spear Street and would not affect use or development of the PortWalk or Bayside History Walk. Construction noise associated with the HDD rig and use of the staging area is addressed in Section 5.12, Noise. After completing the HDD installation, the transmission line would not disrupt aboveground use.

The buried submarine cable and the HDD segments of the project would be within BCDC jurisdiction in the bay. As noted above, Policy 5 of Part IV, Other Uses of the Bay and Shoreline, states that high voltage transmission lines should be placed in the bay only when there is no reasonable alternative. Prior to filing the application for the Proposed Project and the Proponent's Environmental Assessment (PEA) with the CPUC, PG&E considered developing the transmission line along underground routes in the city streets. PG&E determined that retrofitting the existing transmission lines would not be practical, and new underground construction would have greater costs, would be likely to cause greater construction disruptions to existing land uses, and would be less desirable from an engineering perspective when compared with the offshore route (PG&E, 2012a). See Section 1.4 (PG&E PEA Alternatives Considered) for more information on the alternatives considered and why each was not selected.

The proposed transmission line would 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 would be drilled under the shoreline area and would 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 would 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 would not affect future development of the Bay Trail system or the Blue Greenway.

Two sections of the cable along the southern line would be located in private property, 760-feet in the DHL property and a second 100-foot long portion connecting the proposed Potrero Switchyard to the cable in franchise (public ROW) in 23rd Street. A Temporary Construction Easement 50-feet wide and a permanent 30-feet wide easement would be acquired from the private property owner beyond the DHL gate.

The transmission line would be installed in 23rd Street, outside of the planning area for the Pier 70 Preferred Master Plan and Slipways Park and there would be no direct impact to the planning area. The main access to the park would be on 22nd Street and it would not be affected by the project.

Potrero Switchyard Site. The new Potrero 230 kV Switchyard would not be located within BCDC jurisdictional areas because it is located outside the planning area of either the Waterfront Land Use Plan or the Pier 70 Preferred Master Plan. Construction activity related to transferring the pipe and casing of the HDPE conduit from 23rd Street would be would be within BCDC jurisdiction at the shoreline, which is covered by riprap; the pipe would be connected to a small boat and dragged until the pipe is floating on the water for positioning along the surface of the water to each HDD exit. Once the HDPE pipe would be floated into place, the front end would be sunk and hooked up to the drill pipe, and the pullback would proceed. The Potrero Switchyard is within the City's Central Waterfront planning area. The new 230 kV switchyard would 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 would be 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 would be compatible with existing land use and land planning and zoning in the area. Therefore there would 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.

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Source: PG&E, 2012.

Figure 5.10-1
Embarcadero Area Existing Land Use

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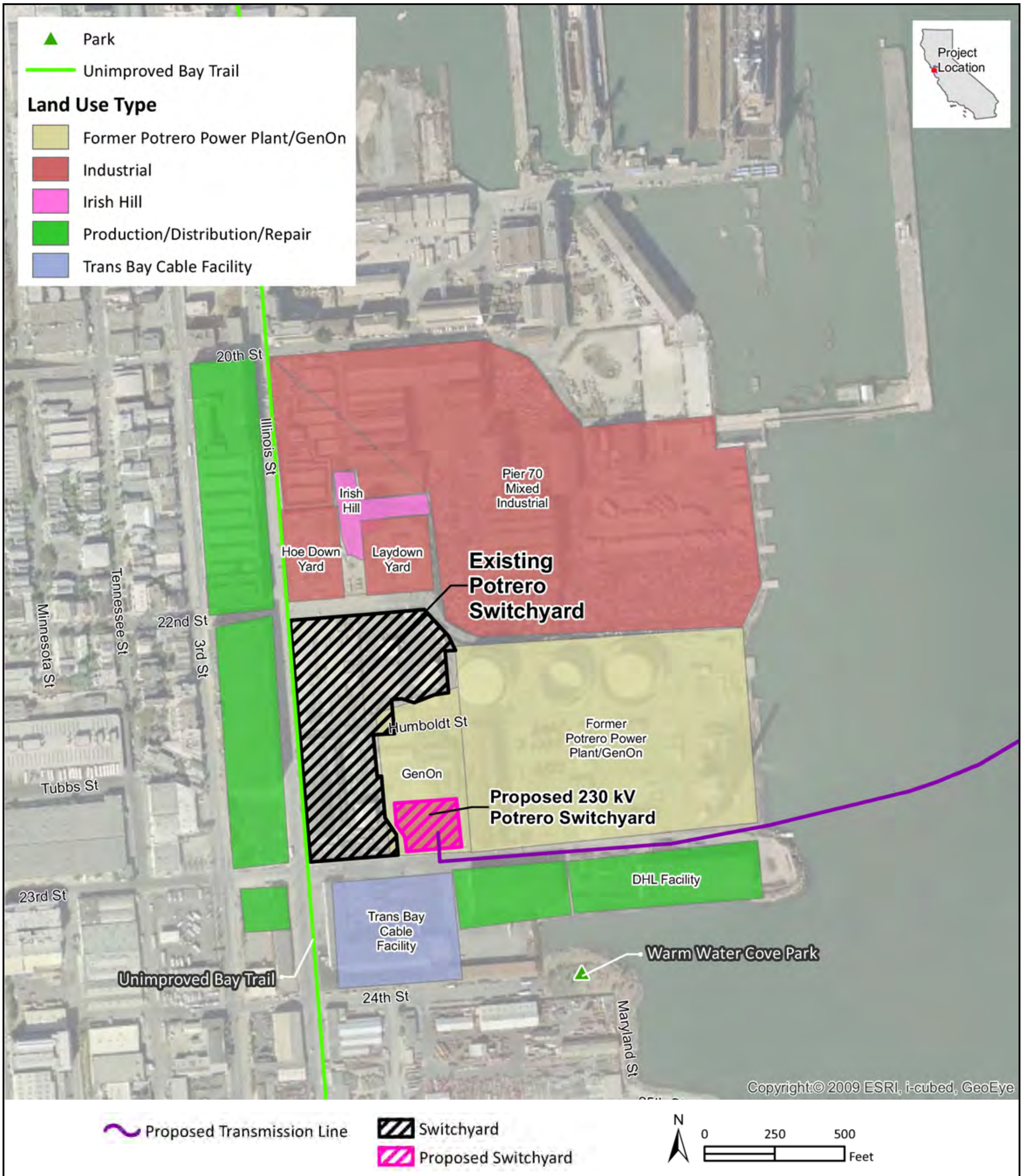

Source: PG&E, 2012.

Figure 5.10-2
Potrero Area Existing Land Use

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5.11 Mineral Resources

MINERAL RESOURCES **Would the project:**	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?	☐	☐	☐	☒
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?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

5.11.1 Setting

In accordance with the Surface Mining and Reclamation Act of 1975, the California Department of Conservation, Division of Mines and Geology (CDMG) has mapped non-fuel mineral resources of the State to show where economically significant mineral deposits are either present or likely to occur, based on the best available scientific data. These resources have been mapped using the California Mineral Land Classification System, which includes the following four Mineral Resource Zones (MRZs):

- MRZ-1: Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence;
- MRZ-2: Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence;
- MRZ-3: Areas containing mineral deposits, the significance of which cannot be evaluated; and
- MRZ-4: Areas where available information is inadequate for assignment to any other zone.

All land in the City and County of San Francisco, including the project site, is designated MRZ-4.1 Thus, the site is not a designated area of significant mineral deposits. There are no mining activities in the project vicinity (Kohler, 2006).

Applicant Proposed Measures

There are no Applicant Proposed Measures for mineral resources.

5.11.2 Environmental Impacts and Mitigation Measures

a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?

NO IMPACT. The project alignment is not within a classified MRZ. There are no active mining operations along the power line alignment. Embarcadero and Potrero Substations are not located in mineral resource areas, and no known important mineral resources are in the vicinity of the project corridor. No impact to known mineral resources would occur.

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. There are no known locally important mineral resource recovery sites within the project vicinity. There would be no impact to locally important mineral resources.

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5.12 Noise

NOISE Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	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?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

5.12.1 Setting

Existing Conditions

Community Noise. To describe environmental noise and to assess project impacts on areas that are sensitive to community noise, a measurement scale that simulates human perception is used. The A-weighted scale of frequency sensitivity accounts for the sensitivity of the human ear, which is less sensitive to low frequencies, and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that can be used to conveniently compare wide ranges of sound intensities.

Community noise levels can be highly variable from day to day as well as between day and night. For simplicity, sound levels are usually best represented by an equivalent level over a given time period (Leq) or by an average level occurring over a 24-hour day-night period (Ldn). The Leq, or equivalent sound level, is a single value (in dBA) for any desired duration, which includes all of the time-varying sound energy in the measurement period, usually one hour. The L50, is the median noise level that is exceeded fifty per cent of the time during any measuring interval. The Ldn, or day-night average sound level, is equal to the 24-hour A-weighted equivalent sound level with a 10-decibel penalty applied to nighttime sounds occurring between 10:00 p.m. and 7:00 a.m. Community Noise Equivalent Level (CNEL) is another metric that is the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m. To estimate the day-night level caused by any noise source emitting steadily and continuously over 24-hours, the Ldn is 6.4 dBA higher than the source's Leq. For example, if the expected continuous noise level from equipment is 50.0 dBA Leq for every hour, the day-night noise level would be 56.4 dBA Ldn.

Community noise levels are usually closely related to the intensity of human activity. Noise levels are generally considered low when below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In wilderness areas, the Ldn noise levels can be below 35 dBA. In small towns or wooded and lightly used residential areas, the Ldn is more likely to be around 50 or 60 dBA. Levels around 75 dBA are more common in busy urban areas, and levels up to 85 dBA occur near major freeways and airports. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be adverse to public health.

Surrounding land uses dictate what noise levels would be considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less. Areas with full-time human occupation and residency are often considered incompatible with substantial nighttime noise because of the likelihood of disrupting sleep. Noise levels above 45 dBA at night can result in the onset of sleep interference. At 70 dBA, sleep interference effects become considerable (USEPA, 1974).

Fundamentals of Vibration. As described by the Federal Transit Administration (FTA), ground-borne vibration, in contrast to airborne noise, is not a common environmental problem, and it is uncommon for vibration caused by heavy vehicles, such as trucks and buses, to be perceptible, even close to major roads. However, the FTA notes that "ground-borne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard." Another common source of vibration is certain construction activities, such as pile-driving and the operation of heavy earthmoving equipment. The effects of energy transferred through the soils to building foundations can include perceptible movement of building floors or rumbling sounds. Most construction-related vibration would not be capable of structural damage, with the exception of impact activities such as pile driving. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin. The vibration level that causes annoyance is well below the damage threshold for normal buildings. Receptors sensitive to vibration include certain structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal in inches per second. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS (relative to 10^{-6} inches per second). The decibel notation acts to compress the range of numbers required to describe vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration.

Noise Environment in the Project Area

The project would be located entirely in San Francisco. The proposed transmission line would be primarily underwater in the San Francisco Bay, with the underground portion of the line in city streets terminating at the Potrero Switchyard and Embarcadero Substation.

Embarcadero Substation and Northern Onshore Area. The northern onshore portion of the line would follow a route from the shore of the bay to Embarcadero Substation. This area is developed with commercial and residential uses (see Figure 5.10-1), and noise from traffic on the Bay Bridge affects locations in the area that have a line-of-sight to the bridge. The nearest residential uses are along Spear Street and Folsom Street adjacent to where the line would be constructed, and a day care center is on Spear Street. Residential buildings are also adjacent to the Embarcadero Substation. Street-level residences (townhomes) also occur on Spear Street adjacent to the proposed northern HDD transition area. Day-night noise levels are highest near the Bay Bridge, where modeling indicates levels over 70 dBA Ldn along Spear Street and 65 to 70 dBA Ldn along Folsom Street, as shown in the San Francisco General Plan (San Francisco Planning Department, 2009). Noise measurements were collected by PG&E in the HDD area between July 31, 2012 and August 2, 2012 (see Figure 5.10-1). These data show that minimum nighttime noise levels are 62 dBA Leq and normal daytime levels are between 68 and 70 dBA Leq, as presented in Table 5.12-1.

Potrero Switchyard and Southern Onshore Area. The southern onshore portion of the line would follow a route from the shore of the bay to a new Potrero 230 kV Switchyard. This area is developed with industrial and commercial uses and the existing terminus for the Trans Bay Cable transmission line (see Figure 5.10-2). Noise measurements were taken between September 12 and 13, 2005 at the facility across 23rd Street from the Potrero Switchyard as part of the Trans Bay Cable EIR (City of Pittsburgh, 2006). The daytime Leq measured at this site was 63.8 dBA, and the nighttime Leq was measured at 52.9 dBA.

The San Francisco General Plan includes a map of background noise levels throughout the City, based on noise modeling done by the San Francisco Department of Public Health of baseline traffic from the San Francisco County Transportation Authority travel demand model. The map of background noise levels shows the range of Ldn values that occurs along every street in San Francisco. The maps show that the adjacent roadway segments of 23rd Street and Illinois Street cause noise levels between 50 and 55 dBA Ldn at the Potrero Switchyard (San Francisco Planning Department, 2009).

The nearest residential use is located approximately 700 feet from the proposed Potrero 230 kV Switchyard (PG&E, 2012a).

Marine Environment. Noise sources in the marine portion of the project area include intermittent ships and environmental factors. The Embarcadero, including the Bay Trail/Pedestrian Promenade, is near the northern end of the proposed submarine route. At the southern end of the proposed submarine route, line would be near existing industrial and commercial areas (see Figures 5.10-1 and 5.10-2).

Underwater noise is produced by marine vessels or construction occurring in the water, and excessive underwater sound pressure levels can cause adverse effects to marine mammals (see Section 5.4.1, Biological Resources). Source levels between 180 to 190 decibels referenced to 1 micropascal at one meter (180 to 190 dB re 1 μPa) occur from common anthropogenic sources, such as large marine vessels. Smaller workboats and ships have source levels around 160 to 180 dB re 1 μPa at one meter, and typical dredging and underwater drilling source levels are lower than or comparable to those from large vessels at 145 to 190 dB re 1 μPa (Defra-Cefas, 2009; Table 3).

Hydroacoustic noise diminishes over distance as it emanates from the source, although noise propagation through water is much more efficient than it is through the air. Ambient underwater noise levels in the project area are heavily influenced by the anthropogenic activity throughout the bay. The California Department of Transportation reports that receivers 100 meters away from a typical large ship experience levels up to 160 dB (Caltrans, 2009). Peaks between 120 to 155 dB and an average (RMS) underwater ambient noise level of 133 dB represent the baseline ambient underwater noise for the open water of the San Francisco Bay and Oakland outer harbor (Caltrans, 2009).

Table 5.12-1. Noise Measurements at the Northern HDD Area

Date	Time	Leq	L10	L50	L90	Date	Time	Leq	L10	L50	L90
31-Jul	7:00 PM	69	70	66	64	1-Aug	4:00 PM	68	71	66	64
31-Jul	8:00 PM	68	70	68	66	1-Aug	5:00 PM	70	73	68	65
31-Jul	9:00 PM	68	69	68	66	1-Aug	6:00 PM	70	73	67	64
31-Jul	10:00 PM	68	70	68	66	1-Aug	7:00 PM	67	69	65	62
31-Jul	11:00 PM	67	70	67	64	1-Aug	8:00 PM	68	69	67	65
1-Aug	12:00 PM	66	69	65	62	1-Aug	9:00 PM	68	69	67	66
1-Aug	1:00 AM	65	67	63	58	1-Aug	10:00 PM	64	67	62	57
1-Aug	2:00 AM	63	66	62	56	1-Aug	11:00 PM	66	68	66	63
1-Aug	3:00 AM	62	65	61	55	2-Aug	12:00 AM	66	68	65	62
1-Aug	4:00 AM	64	67	62	57	2-Aug	1:00 AM	66	67	63	59
1-Aug	5:00 AM	66	69	66	61	2-Aug	2:00 AM	63	65	62	57
1-Aug	6:00 AM	69	71	69	66	2-Aug	3:00 AM	62	65	60	55
1-Aug	7:00 AM	70	72	70	68	2-Aug	4:00 AM	64	67	62	57
1-Aug	8:00 AM	68	70	67	64	2-Aug	5:00 AM	66	69	66	62
1-Aug	9:00 AM	69	71	68	66	2-Aug	6:00 AM	69	71	69	66
1-Aug	10:00 AM	69	71	69	67	2-Aug	7:00 AM	69	71	69	65
1-Aug	11:00 AM	68	70	68	66	2-Aug	8:00 AM	68	71	68	65
1-Aug	12:00 PM	68	70	68	65	2-Aug	9:00 AM	69	71	69	67
1-Aug	1:00 PM	67	69	66	63	2-Aug	10:00 AM	69	71	68	66
1-Aug	2:00 PM	68	70	67	64	2-Aug	11:00 AM	68	70	68	66
1-Aug	3:00 PM	69	72	67	65	2-Aug	12:00 PM	69	70	67	63

Source: PG&E 2012a.

Noise Sensitive Areas

Noise sensitive receptors include residences, day cares, schools, religious facilities, hospitals, and parks (see Figures 5.10-1 and 5.10-2 for a map of nearby sensitive receptors). Residential land uses in the northern onshore section are typically apartments or condominium towers, often with commercial use at street level (see Figure 5.10-1). These towers occur along Spear and Folsom Streets and the HDD area where project construction would occur. Street-level apartments occur along the partial block of Spear Street south of Harrison Street, within 25 feet of the proposed underground construction and the northern HDD transition work area. The final location of the line within the streets, and thus precise distance to these residences, would be determined by final engineering design. A day care facility with a street-level outdoor play area, the Bright Horizons/Marin Day School at Hills Plaza, also occurs on Spear Street adjacent to the proposed alignment, and Eucharist SF church is along the proposed alignment on Folsom Street (Google Earth, 2013). As noted above, the closest sensitive receptors to the Potrero Switchyard portions of the project are residences approximately 700 feet from the proposed alignment and switchyard (see Figure 5.10-2). The submarine portion of the project route would not encounter any noise-sensitive land uses (see Figure 5.10-1 and Figure 5.10-2).

Applicable Regulations

Regulating environmental noise is generally the responsibility of local governments. In 1974 the USEPA published guidelines on recommended maximum noise levels to protect public health, and the State of California maintains recommendations for local jurisdictions in the General Plan Guidelines published by the Governor's Office of Planning and Research (OPR, 2003). Because there is no statewide noise regulation or specific threshold for determining what constitutes a "substantial increase" in noise, the CEQA lead agency defines what noise level increase would be considered substantial. Given that environmental noise levels vary widely over time, a three dBA change is the minimum change in environmental noise that is perceptible and recognizable by the human ear. Permanent increases in day-night environmental noise levels of more than 5 dBA (Ldn or CNEL) are considered to be substantial. Intermittent noise sources, such as construction, may be temporary or periodic and may cease after a short time. Factors to be considered in determining the significance of an adverse construction impact include: (1) the resulting noise or vibration level, (2) the duration and frequency of the noise or vibration, (3) the number of people affected, and (4) the land use designation of the affected receptor sites.

The following summarizes the local requirements.

San Francisco General Plan, Environmental Protection Element. The General Plan identifies the ranges of noise levels considered generally compatible or incompatible with various land uses to guide decisions on providing sound insulation for affected properties. The General Plan focuses on the effect that noise from ground-transportation noise sources has on the community. Residential uses are considered compatible in areas where the noise level is 60 dBA Ldn or less, and schools, which is taken to include day care centers or pre-school, are compatible in areas where the noise level is 65 dBA Ldn or less.

San Francisco Police Code, Article 29, establishes the regulatory framework for addressing operational and construction related noise and was amended in June 2012. Section 2909 of the code limits the increase of operational noise 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 noise level as measured outside the property plane. Section 2907 of the code limits construction noise from individual powered construction equipment between the hours of 7:00 a.m. to 8:00 p.m. to 80 dBA when measured at 100 feet. There are additional limitations on pieces of impact equipment (such as pavement breakers and jackhammers) which require intake and exhaust silencers in addition to acoustical attenuation shields or shrouds. Section 2908 of the code requires that nighttime construction noise (8:00 p.m. to 7:00 a.m.) be no more than 5 dBA above existing local ambient noise levels at the property plane; however, the Director of Public Works or Building Inspection may grant a special permit, especially if the proposed night work is in the general public interest.

Federal Transit Administration Guidelines. The Federal Transit Administration (FTA) has guidelines for judging the significance of vibration produced by transportation sources and construction activity. These guidelines recommend vibration levels in RMS from 72 VdB to 80 VdB for residential uses and buildings where people normally sleep; and 75 VdB to 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, offices). The higher vibration levels in these ranges apply to infrequent events (less than 30 per day) and the lower levels apply to frequent vibration events (more than 70 per day). According to FTA guidelines for rail transit systems, a vibration level of 65 VdB is the threshold of perceptibility for humans and recurring levels over 80 VdB would cause residential annoyance (FTA, 2006).

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study (see Table 5.12-2).

Table 5.12-2. Applicant Proposed Measures (APMs) Related to Noise

APM Number	Issue Area
	Noise
APM 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, and/or 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.

5.12.2 Environmental Impacts and Mitigation Measures

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 WITH MITIGATION – CONSTRUCTION. Construction of the Proposed Project would involve use of augur drill rigs, backhoes, cranes, dump trucks, graders, pickup trucks, tractors, compressors, generators, and other equipment. Transmission line construction duration would involve approximately 15 months of work offshore and in city streets, 5 days per week, during daytime hours, progressing from one area to another along the route. Trench excavation and manhole installation would cause the highest noise levels of the underground construction, and the duration for this work, not including cable pulling and HDD operations, would be approximately four months along the northern underground segment and two months along the southern underground segment.

Construction noise sources would occur within the streets of the proposed 230 kV transmission line route: Folsom Street, Spear Street, and 23rd Street. Construction of the proposed Potrero 230 kV Switchyard would occur approximately 700 feet away from the nearest residences. However, activities for underground construction along the northern onshore segment would occur through a densely developed urban mixed-use area, with some activity being as near as 25 feet from apartment buildings, condominium buildings, and the day care center at Hills Plaza, depending on final engineering design. All construction traffic would gain access to the proposed work areas by existing city streets in the project area. Noise levels for typical pieces of construction equipment (at 50 feet) that would be used are listed in Table 5.12-3.

All construction activities would create both intermittent and continuous noises. Intermittent noise would result from periodic, short-term equipment use, such as cranes for positioning equipment or backhoes for trenching. Continuous noise would result from steady equipment operation over longer periods of each workday, such as generator use. The maximum intermittent construction noise levels would range from 81 to 85 dBA at 50 feet from an active construction area (PG&E, 2012a).

Table 5.12-3. Typical Noise Levels for Construction Equipment

Equipment	Typical Noise Levels (dBA, at 50 feet)
Drill Rig	70-85
Backhoes	80-85
Cranes	85
Pick-up truck	55
Dump truck	76
Equipment/tool van	55
Compactors	82
Grader	85
Hole auger	84

Sources: Adapted from USEPA, 1974.

Trenching and Other Linear Work. The linear nature of the underground construction would create a construction zone that spreads equipment along the corridor so that sources are not likely to be grouped together. PG&E modeled the typical noise levels for construction equipment in a linear configuration for this transmission line, and found that locations adjacent to the alignment would be exposed to approximately 83 dBA Leq, as shown in Table 5.12-4.

Table 5.12-4. Linear Work Zone Construction Noise Levels versus Distance

Distance from Construction Activity (feet)	Leq Noise Level (dBA)
50	83
100	79
200	74
400	69
800	63

Source: PG&E, 2012a.

Sound from stationary sources decreases by six dBA with every doubling of distance from the source. At a distance of 100 feet between the noise source and the receiver, the maximum noise level would be approximately 79 dBA, and thus would be less than 80 dBA at 100 feet and within the daytime noise limit established by the San Francisco Police Code. The Bright Horizons/ Marin Day School is licensed to provide care for 31 children (CCLD, 2013), and the site includes an outdoor play area adjacent to the sidewalk on Spear Street that could be used by children during project construction hours. Trenching and other underground construction along Spear Street could be within 25 feet of the outdoor day care play area; the resulting peak noise levels could briefly be very high, potentially over 85 dBA. Trenching activity would progress at approximately 50 feet per day along the along the onshore segment. Within the four-month period of trench excavation and manhole installation along Folsom and Spear Streets, trenching within 100 feet of any single location would be limited in duration to about four days as crews would gradually move along the linear work zone. For any single location, all construction noise would be short term and intermittent, with maximum noise levels not maintained at all times.

APMs NO-1 through NO-7 would reduce the construction noise levels and by doing so would also reduce the number of people affected. Specifically, under APM NO-1 PG&E would shield compressors and small stationary equipment with portable barriers if located within 200 feet of a residence, including along Spear Street near the day care center at Hills Plaza. Additionally truck traffic would be routed away from noise-sensitive areas where feasible (APM NO-4), and PG&E would require its contractors to ensure all equipment is in good working order, adequately muffled and maintained in accordance with the manufacturers' recommendations (APM NO-7). Implementation of APM NO-6 would include measures, such as temporary barriers, to minimize HDD noise, as discussed separately below.

Although daytime construction noise caused by the work zones would not exceed the standards of the San Francisco Police Code, nighttime construction could be warranted for certain activities including HDD, discussed separately below, and additional mitigation would be warranted to ensure enforceability of the APMs. As noted in the Project Description (Section 4.11), if trenching work would cause potential traffic congestion, the project may require nighttime work to avoid traffic disruption. In the event that nighttime construction is necessary, the likelihood of sleep disturbance would increase, but under APM NO-5, affected residents would be notified in advance by mail, personal visit, or door-hanger and informed of the expected work schedule. During nighttime construction, no children would be present at the Bright Horizons/Marin Day School day care center.

Mitigation is recommended to ensure consistency with local community plans. General Construction Noise Control Measures were recently adopted by the City for the Transit Center District Plan (TCDP) area (San Francisco Planning Department, 2011), and supplementing the APMs with these General Construction Noise Control Measures would ensure that development in the northern onshore project area would not cause significant noise impacts. The City's General Construction Noise Control Measures in the TCDP EIR include: using best available noise control techniques, locating equipment away from sensitive land uses, installing portable barriers, which would be partially implemented by APMs NO-1 and NO-7. Mitigation is also necessary to enforce the proposal that PG&E would use equipment that incorporates noise-control elements into the design (APM NO-2) and that equipment exhaust stacks and vents would be directed away from buildings (APM NO-3). The TCDP EIR also includes additional feasible noise control measures that have not been proposed within the APMs for this project, including: specifications for impact tools; requiring noise control requirements in contractor specifications; and following a plan to respond to and track complaints pertaining to construction noise. To ensure that construction noise would occur in a manner consistent with local community plans, Mitigation Measure N-1 would implement the portions of the City's General Construction Noise Control Measures that would not otherwise be implemented by the APMs. The discussion of HDD noise appears separately below.

With implementation of Mitigation Measure N-1, the noise levels from trenching and other underground linear construction would be less than significant under this criterion.

Mitigation Measure for Underground Transmission Line Construction Noise

MM N-1 **Implement General Noise Control Measures**. PG&E shall implement the following general noise control measures in addition to APMs NO-1 to NO-7, with APMs NO-2 and NO-3 superseded:

- PG&E and contractors shall use equipment that incorporates noise-control elements into the design.
- PG&E and contractors shall ensure equipment exhaust stacks and vents are directed away from buildings.
- Where use of pneumatic tools, such as impact tools (e.g., jack hammers and pavement breakers), is unavoidable, a noise source screen such as a barrier around the activity using the tools, an external noise jacket, or an exhaust muffler on the compressed air exhaust shall be used and shall be designed to reduce noise levels from the source by 10 dBA.
- PG&E shall include noise control requirements in specifications provided to construction contractors. Such contract specifications would include, but not be limited to, performing all work in a manner that minimizes noise; use of equipment with effective mufflers; undertaking the most noisy activities during times of least disturbance

to surrounding residents, day care operations, and commercial uses; and using haul routes that avoid residential buildings inasmuch as such routes are otherwise safely available.

- PG&E shall respond to and track complaints pertaining to construction noise. PG&E shall provide a complaint hotline phone number that shall be answered at all times during construction and designate an on-site construction complaint and enforcement manager for the project. The noise complaint and response process shall be described in the residential notifications required under APM NO-5 and posted publicly near work areas that are within 300 feet of residential buildings or day care operations.

Horizontal Directional Drilling. HDD would be used at two locations: the Embarcadero HDD Transition Area (see Figure 4-8) and the Potrero HDD Transition Area (see Figure 4-9). Figures 5.10-1 and 5.10-2 show the location of the HDD construction areas and the surrounding uses, where noise-generating activities related to HDD excavation and drill rig use would occur. The drill rig would typically require 13 days per each of three bores, drilled separately, for a total of 39 days of drill rig use in each transition area. At each HDD transition area, the drilling would run up to 6 days per week and 10 hours per day, extending over a period of about 6 to 7 weeks. PG&E's proposal would include the following HDD equipment at each transition area:

- DD-330 American Augers trailer mounted drill rig or equivalent
- Mud rig
- Mud pump
- Two centrifugal pumps
- Excavator
- Engines equipped with "hospital grade" exhaust mufflers (PG&E, 2012a).

Based on these plans, sound pressure levels from the operation of construction equipment could be as high as 83 dBA at 100 feet (PG&E, 2012a), potentially exceeding the 80 dBA threshold established by the San Francisco Police Code. Noise barriers described in APM NO-6 were modeled by PG&E to reduce these levels by a minimum of 5 dBA, resulting in a controlled maximum sound pressure level of 78 dBA at 100 feet. Table 5.12-5 provides noise estimates after implementation of APM NO-6 (PG&E, 2012a). The barriers described in APM NO-6 would ensure that daytime construction noise caused by the HDD equipment would not exceed the standards of the San Francisco Police Code. A discussion of nighttime HDD activity follows.

Table 5.12-5. HDD Equipment Noise Levels after Implementation of Noise Reduction Measures

Distance from HDD Entry Point (feet)	Leq Noise Level (dBA)
50	83
100	78
200	72
400	66
600	63
800	60

Source: PG&E, 2012a.

The street-level Harbor Lofts townhomes (46 live/work lofts at 400 Spear Street) would be the nearest residences, at approximately 25 feet from the nearest edge of the HDD work area. Because of the proximity, these residences would experience very high exterior noise levels caused by the HDD activities, potentially over 85 dBA. Although PG&E plans to conduct the HDD activities during the daytime over a limited duration of 7 weeks at each transition area, the impact from HDD noise during the nighttime hours would be more severe. If soil conditions are such that the integrity of the hole cannot be readily maintained with daytime only activities, HDD operations would have to proceed on a 24-hour basis.

Nighttime HDD work would allow the installation to occur more quickly, and this would shorten the duration of the noise impact to less than 7 weeks. However, residences could be exposed to construction noise in excess of the nighttime standards in the San Francisco Police Code. Because of the close proximity of residences to the HDD area, in some cases construction noise could exceed the 5 dBA above ambient noise nighttime threshold established by the Police Code.

Implementation of Applicant Proposed Measures, especially APM NO-5, under which PG&E would notify affected residents in advance by mail, personal visit, or door-hanger, would improve residents' ability to anticipate and prepare for nearby nighttime construction, which would reduce the number of people affected by the increased noise. To be consistent with Section 2908 of the Police Code, nighttime or 24-hour activity would require a special permit from the Director of Public Works or Building Inspection.

Mitigation is recommended to supplement the HDD noise control strategies in APM NO-6 (HDD Noise Minimization Measures), which specifically require monitoring the actual noise levels at night and taking corrective action to minimize the noise associated with HDD work. Mitigation would also ensure enforceability of the noise controls to be consistent with the nighttime standard in the Police Code. Mitigation Measure N-2 would ensure that PG&E obtains the special permit from the Director of Public Works or Building Inspection in anticipation of 24-hour HDD activity, should it become necessary. With the recommended Mitigation Measure N-2 and implementation of the APMs, the noise impact from the nighttime HDD activity would be reduced to a less-than-significant level.

Mitigation Measure for 24-Hour HDD Noise

MM N-2 **Obtain Special Permit for Nighttime HDD Noise.** This mitigation measure is to supplement and ensure enforceability of APM NO-6 for noise sources at the Embarcadero HDD Transition Area.

- PG&E shall apply to the San Francisco Director of Public Works and obtain a special permit for nighttime or 24-hour activity at the Embarcadero HDD Transition Area, consistent with Section 2908 of the Police Code. Prior to commencing construction of the HDD, PG&E shall provide to the CPUC a copy of the special permit or evidence that no permit is required by San Francisco.
- PG&E shall provide to the CPUC at least 7 days prior to commencing construction of the Embarcadero HDD Transition Area the results of actual ambient hourly (Leq) noise measurements for each hour between 8:00 p.m. to 7:00 a.m. at the edge of the nearest private property containing residential use obtained from monitored noise levels as specified in APM NO-6.
- PG&E and contractors conducting nighttime work at the Embarcadero HDD Transition Area, between 8:00 p.m. to 7:00 a.m., shall implement noise attenuation features, including acoustical barriers, blankets and enclosures as identified in APM NO-6, to achieve no more than 5 dBA above existing local ambient noise levels at the edge of the nearest private property containing residential use, based on 1-hour Leq.
- PG&E shall provide a report to the CPUC actions taken to reduce the duration or level of noise within 48 hours of monitoring noise levels found to be in excess of the ambient noise level by 5 dBA, at the edge of the nearest private property containing residential use, based on 1-hour Leq.

LESS THAN SIGNIFICANT – SUBMARINE CABLE INSTALLATION. In the marine segment, cables would be installed by using a jet plow or other similar cable burying technique. As the majority of cable laying activity would occur underwater, equipment used on the barges and other marine vessels would not create substantial increases to ambient airborne noise levels onshore. Aside from marine biological resources, which are addressed in Section 5.4, no sensitive land uses would occur near the offshore installation of the transmission line, which would be at least a quarter-mile from land. Because the submarine construction would not result in exposure of persons to or generation of noise levels in excess of any applicable standards, this impact would be less than significant.

Underwater sound levels would be affected by the cable laying barge and hydroplow. The available literature indicates that the underwater noise source level could reach 185 dB from high pressure water jets for cable-laying (Talisman, 2005) or for dredging (Defra-Cefas, 2009). PG&E proposes to use a hydroplow with low pressure water jets that would cause less noise and generally be engaged below the seabed, which would also act to attenuate or dampen noise generated by the water jets (PG&E, 2013). To put this source into context, a compendium of hydroacoustic source level data for pile insertion methods shows that underwater noise levels at 10 meters (32.8 feet) distance in shallow water from vibratory installation of small piles (less than 12 inches) range up to 171 dB peak with an average of 155 dB (Caltrans, 2012). For comparison, the analysis of underwater cable laying in the Trans Bay Cable EIR (City of Pittsburgh, 2006) found that the shallow-water sound levels within approximately 800 feet of a hydroplow could be over 160 dB. Similar underwater sound levels would be likely to occur during cable laying and hydroplow use for the Proposed Project. Underwater acoustics throughout the active shipping areas of the San Francisco Bay are presently affected by large vessels, barges, and tugs, which currently occur intermittently in the marine project area. Baseline ambient underwater sound levels range up to 155 dB peak with an average of 133 dB in the open water of the San Francisco Bay (Caltrans, 2009). Based on the various data, 170 to 185 dB peak levels could occur near the sources of the underwater noise from the Proposed Project. These levels would attenuate to become comparable to the background ambient conditions at a distance of about 800 feet.

LESS THAN SIGNIFICANT – OPERATION AND MAINTENANCE. There are three potential sources of operational noise associated with the electric power lines and substations in this project: corona noise from the transmission line; transformer and shunt reactor noise from Potrero Switchyard; and vehicle noise from maintenance vehicles.

Audible corona noise would not be a design concern for underground and submarine portions of the Proposed Project, given that the line would be buried. The existing Embarcadero Substation is within an enclosed building and the northern terminal of the proposed transmission line would occur inside either the existing building or the building being developed as part of the Embarcadero 230 kV Bus Upgrade Project. As a result, all operational noise impacts at the Embarcadero Substation would occur inside and would not increase outdoor ambient levels, resulting in an impact that would be less than significant.

The new outdoor transformer and shunt reactor for the proposed Potrero 230 kV Switchyard would be designed to achieve PG&E's design criteria, resulting in a combined maximum sound level of 53 dBA at a distance of 400 feet (PG&E, 2012a). This sound level would be comparable to or less than the existing nighttime noise levels, which were measured at 52.9 dBA Leq (City of Pittsburgh, 2006) and are between 50 and 55 dBA Ldn based solely on traffic (San Francisco Planning Department, 2009), and the impact of the new sources would be further reduced by intervening structures and by enclosure of the facilities within a building. The nearest sensitive receptor is approximately 700 feet away. Adding the proposed outdoor equipment to the existing noise environment would not exceed the threshold for new sources or the limitation for sources on commercial and industrial properties in Article 29 of the San Francisco Police Code because the project would not cause an increase of 8 dBA over the existing ambient noise levels. Because the operation noise levels would be less than 60 dBA Ldn, the project would also conform with the compatibility guidelines of the General Plan. The impact of the operational noise would be less than significant.

Maintenance activities required for the Proposed Project would be substantially similar to those currently performed at the Potrero Switchyard and Embarcadero Substation. Maintenance activities would occur over short timeframes and generate minimal noise. For maintenance activities involving noise-generating equipment or vehicles, noise reduction measures would be employed to reduce temporary noise impacts as described in APMs above. Maintenance activities would thus not increase noise levels above existing conditions, and the impacts from maintenance noise would be less than significant.

b. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

LESS THAN SIGNIFICANT – CONSTRUCTION. The level of groundborne vibration that could reach sensitive receptors during construction depends on the distance to the receptor, what equipment is creating vibration, and the soil conditions surrounding the construction site. Vibration from construction equipment and activities would be perceptible to people in the immediate vicinity of construction activities while they were occurring. Tamping of ground surfaces, the passing of heavy trucks on uneven surfaces, and drilling would each create perceptible vibration in the immediate vicinity of the activity. Activities that generally create substantial groundborne vibration, such as pile driving, would not occur as part of the Proposed Project. Earthmoving equipment that could result in groundborne vibration or noise would occur during daytime hours. The impact from construction-related groundborne vibration would be confined to only the immediate area around the activity (within about 50 feet).

Vibration during project underground construction and installing the HDD could affect nearby structures, including the Bay Bridge, which includes a tower foundation that would be immediately adjacent to the proposed HDD area on Spear Street. Table 5.12-6 shows the typical vibration levels caused by construction equipment, and use of heavy equipment for underground construction could generate vibration levels up to 0.089 in/sec PPV or 87 VdB at a distance of 25 feet. Vibration levels, measured as PPV at a distance of 82.5 feet would be reduced by more than 80 percent. For the anticipated types of equipment, construction activities would generate ground-borne vibration levels that would not exceed the FTA criterion of 0.2 in/sec PPV, which would avoid the potential structural damage.

Table 5.12-6. Vibration Velocities for Construction Equipment

Equipment/Activity	PPV at 25 Feet (inch/second)	PPV at 82.5 Feet (inch/second)	RMS at 25 Feet (VdB)	RMS at 82.5 Feet (VdB)
HDD Rig (estimated)*	0.089	0.016	87	72
Large Bulldozer	0.089	0.016	87	72
Loaded Trucks	0.076	0.013	86	71
Small Bulldozer	0.003	0	58	43
Threshold to Avoid Potential Effects	0.2	0.2	80	80

RMS = Root mean square of vibration level, relative to 10^{-6} inches per second.
* Based on estimates for caisson drilling in FTA, 2006.
Source: FTA, 2006. San Francisco Planning Department, 2011.

Vibration from construction would most affect sensitive receptors on adjacent parcels. The rights-of-way for Spear Street and Folsom Street are both approximately 82.5 feet wide, but construction could occur within 25 feet of the nearest residential structures. At this distance, vibration could exceed 80 VdB and cause annoyance at residences. As such, construction within 25 feet of the residences could adversely affect occupants of the adjacent properties. The short-term, daytime, and intermittent nature of underground activities would ensure that potentially annoying levels of vibration occur only occasionally as work crews move along the linear work zones. The impact of installing the HDD would be limited to about 39 days of drilling. PG&E plans to limit this activity to during the daytime when receptors are less sensitive unless soil conditions warrant 24-hour work. Implementing APM NO-5 to provide advance notification and inform people in the area would allow people to prepare for potential nighttime annoyance if it becomes unavoidable. The resulting vibration levels would not be considered excessive given the plan to avoid nighttime work, the limited number of residences adjacent to HDD installation, the limited duration of the vibration, and the steps that would be taken through APM NO-5 to avoid interfering with the nearest residential uses, and this impact would be less than significant.

NO IMPACT – OPERATION AND MAINTENANCE. Equipment associated with normal operation and maintenance of the Proposed Project would not produce any groundborne noise or vibration; therefore, operation and maintenance of the project would result in no impact.

c. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

NO IMPACT– CONSTRUCTION. Project construction would be temporary and therefore would not result in a substantial permanent increase in ambient noise levels.

LESS THAN SIGNIFICANT – OPERATION AND MAINTENANCE. The permanent noise sources that would result from the project are limited to transformer and shunt reactor operation at the existing and proposed Potrero Switchyard. Audible corona noise from the transmission line would not increase ambient noise levels because the line would be installed underground. Transformer operations at the Embarcadero Substation would not change. Enclosure within the substation building would prevent any increase in ambient noise levels associated with the project. As noted above, PG&E's design criteria for the new outdoor transformer and shunt reactor at the proposed Potrero Switchyard would achieve a combined maximum sound level of 53 dBA at a distance of 400 feet (PG&E, 2012a), which would not cause ambient noise levels in the area of the Potrero Switchyard to increase substantially, as discussed under Item (a).

Noise would also occur from crews conducting routine inspection and maintenance activities. Routine inspection and maintenance of the Proposed Project would be accomplished through periodic visits to the project components and would not normally involve a large crew. These activities would be isolated, infrequent, and substantially similar to existing maintenance activities.

Given the above, there would be little to no permanent increase in ambient noise levels above existing conditions, and this impact would be less than significant.

d. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

LESS THAN SIGNIFICANT WITH MITIGATION. Noise impacts associated with construction equipment would mainly affect those receptors closest to proposed underground and HDD areas. Existing receptors would experience a temporary increase in noise. During trenching and other underground construction along Spear Street and other city streets with noise-sensitive land uses, peak noise levels could briefly be very high, potentially over 85 dBA and 83 dBA on an Leq basis (Table 5.12-4). Noise from HDD equipment would cause less than 78 dBA Leq at the day care center (Table 5.12-5). These levels would detract from enjoyment and normal use of the day care center and outdoor play area at Hills Plaza. As stated under Item (a), even when peak levels nearest the work could briefly be over 85 dBA, hourly Leq levels would be much lower and would comply with the Police Code threshold of 80 dBA at 100 feet. In addition, the short-term and intermittent nature of noise along the linear construction zone would limit the impacts. Compliance APMs NO-1 through NO-7 would reduce the effects of noise caused by construction equipment and traffic by implementing feasible noise controls and providing advance notification. Notification would inform people in the area and allow them to prepare for potential nighttime disruptions that could still occur after implementing all feasible noise controls. To ensure that construction noise is minimized to the extent feasible and to ensure that residences and the day care center are not exposed a substantial increase in noise levels, Mitigation Measure N-1 (Implement General Noise Control Measures) and Mitigation Measure N-2 (Obtain Special Permit for Nighttime HDD Noise) would require additional controls and specifications for construction equipment and would establish a complaint and resolution process. With the recommended Mitigation Measures N-1 and N-2, along with implementation of APMs NO-1 through NO-7, the impact of temporary construction noise would be reduced to a less-than-significant level.

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?

NO IMPACT. The southern end of the proposed transmission line, at Potrero Switchyard, would be located approximately 9 miles north of the San Francisco International Airport. All project construction, operation, and maintenance would occur greater than 2 miles from the airport, and there would be no impact.

f. For a project within the vicinity of a private air strip, would the project expose people residing or working in the project area to excessive noise levels?

NO IMPACT. The Proposed Project is not located within two miles of a private airstrip, and there are no private airstrips in San Francisco. The Hall of Justice Heliport is approximately 1.1 miles from the Embarcadero Substation, and the helipad under development at the Children's Hospital in Mission Bay would be approximately one mile from the Potrero Switchyard. The Proposed Project would not expose people to excessive noise from aircraft.

5.13 Population and Housing

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?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

5.13.1 Setting

Population

In 2010, the San Francisco Bay Area had a regional population of approximately 7,150,739 people (MTC and ABAG, 2013a). The Proposed Project would be within the City and County of San Francisco, which has a land area of 46.87 square miles and had a population of approximately 805,235 people in 2010 (U.S. Census, 2010). The Association of Bay Area Governments (ABAG) projects that San Francisco's population will rise to 867,100 by 2020 (San Francisco Planning Department, 2011).

Housing

As of 2010, San Francisco had approximately 376,942 housing units with a vacancy rate of 8.3 percent (MTC and ABAG, 2013b). The project would be 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 33,642 hotel rooms and experienced an average vacancy rate of 17.3 percent in January to August 2011 (SFTA, 2013a and 2013b).

Employment

In December 2012, the San Francisco-Oakland-Fremont Metropolitan Statistical Area had an estimated labor force of approximately 2,324,600 people with an unemployment rate of 7.3 percent (BLS, 2013). Between 2007-2011, the City and County of San Francisco had approximately 484,137 people in the labor force (U.S. Census, 2011). It is estimated that approximately 18,775 people or 4.2 percent of employed civilian workers in the City and County of San Francisco worked in the construction industry (U.S. Census, 2011).

Applicant Proposed Measures

There are no Applicant Proposed Measures for population and housing.

5.13.2 Environmental Impacts and Mitigation Measures

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 – CONSTRUCTION. The Proposed Project would not include construction of new homes or businesses, land use changes, or infrastructure extensions that would directly induce substantial population growth in the area. While the Proposed Project would add to the existing electric transmission system, the additional infrastructure is meant to better serve existing customers in the area by preventing service interruptions. As stated in Section 4.9 (Project Overview), PG&E's primary purpose of the project would not be to increase the capacity of the system, but rather to improve transmission system reliability. The current system lacks sufficient capacity to serve current and expected future Embarcadero loads when both existing 230 kV cables into Embarcadero are out of service, for example, in the event of concurrent unplanned outages following a major seismic event, or in the event of a forced outage of one existing 230 kV cable while the other existing 230 kV cable is subject to a planned outage. PG&E states that the Proposed Project is warranted based upon the risk of an overlapping outage of both existing 230 kV Martin-Embarcadero cables; the impact that such an outage would have upon its customers in San Francisco; and the ability of the Proposed Project to mitigate the risk of outage. Thus, the Proposed Project would not induce growth in the project area.

The Proposed Project would require a maximum of 75 construction workers (including switchyard workers, supervisors and inspectors) at any one time. Approximately 20 percent of the workforce (10 to 15 workers) would be locally sourced. PG&E contractors would be required to make a good faith effort to establish a local hiring plan in collaboration with PG&E and City Build, a City of San Francisco agency created to develop local jobs and hiring in the City (PG&E, 2012). There would be adequate hotel and motel accommodations and rental housing within San Francisco to provide accommodations to the 65 workers that may temporarily relocate to the area during the 22-month construction and testing period. No direct or indirect impacts to population growth would occur.

NO IMPACT – OPERATION AND MAINTENANCE. The project would be operated using existing operation and maintenance staff, so no additional personnel would be required after construction is completed. Existing PG&E crews would operate and maintain the new equipment as part of their current operation and maintenance activities. Consequently, operation of the project would not result in substantial population growth in the project area and no direct or indirect impacts would occur.

b. Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

NO IMPACT. The Proposed Project would not displace any existing housing. No impact would occur to housing.

c. Would the project displace substantial numbers of people necessitating the construction of replacement housing elsewhere?

NO IMPACT. The Proposed Project would not displace any people currently living in the project area as construction of the transmission cable would primarily occur in the bay, within existing streets, and other developed areas. The project would not involve new construction at the Embarcadero Substation, and construction activities at the Potrero Switchyard would occur in an industrial area. No impact would occur to housing.

5.14 Public Services

PUBLIC SERVICES 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 public services:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Fire protection?	☐	☐	☒	☐
b) Police protection?	☐	☐	☒	☐
c) Schools?	☐	☐	☐	☒
d) Parks?	☐	☐	☐	☒
e) Other public facilities?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

5.14.1 Setting

Regional

United States Coast Guard

Portions of the project are located in and adjacent to San Francisco Bay. The U.S. Coast Guard (USCG) is the lead federal agency in charge of maritime security and law enforcement. Headquartered on Coast Guard Island in Alameda on the east side of the San Francisco Bay, the Eleventh District of the USCG encompasses California as well as three other states. The Eleventh District includes 48 units and employs over 2,600 active duty, reserve, and civilian employees (USCG, 2013). 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 San Francisco Fire Department (SFFD) when necessary.

Local

Fire Protection and Emergency Services

The SFFD provides emergency services for the City and County of San Francisco, including fire suppression; tactical rescue; emergency medical care; fire prevention; arson investigation; and response to natural disasters, mass-casualties, and hazardous materials incidents. SFFD 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 (PG&E, 2012, p. 3.14-2). The SFFD fire stations closest to the project area are shown in Table 5.14-1.

Police Services

The San Francisco Police Department (SFPD) provides law enforcement services to the City and County of San Francisco, including the project area. The SFPD has 10 district stations divided into two divisions. The stations that would serve the project area are listed in Table 5.14-1. The SFPD also has a Marine Unit that patrols 64 square miles of the San Francisco Bay, maintaining direct contact with the USCG and other marine operators. The SFPD Marine Unit patrols the waterfront and conducts marine recovery operations. It maintains four vessels and two personal watercraft. (SFPD, 2011)

Currently the SFPD has approximately 200 fewer officers than the Charter-mandated minimum of 1,971 sworn officers. 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. (SFPD, 2011)

Table 5.14-1. Emergency Services and Law Enforcement Providers

Station	Address	Project Segment	Distance
United States Coast Guard			
Sector San Francisco Bay	Yerba Buena Island	Marine	2 to 4 miles
San Francisco Fire Department			
Fire Station 1	676 Howard Street at Third Street	Embarcadero Landing to Embarcadero Substation	0.5 to 0.92 miles
Fire Station 35 [Fireboats, Guardian and Phoenix, are docked here]	Pier 22 ½, The Embarcadero at Harrison Street	Marine	0.2 miles (waterfront) to 0.3 miles (Fremont St. and Folsom St.)
Fire Station 25	3305 Third Street at Cargo Way	Potrero Landing to Potrero Switchyard	0.65 to 0.96 miles
San Francisco Police Department			
Southern Station (Company B)	850 Bryant Street	Embarcadero Landing to Embarcadero Substation	1.04 to 1.22 miles
Bayview Station (Company C)	201 Williams Street	Potrero Landing to Potrero Switchyard	1.84 miles

Source: PG&E, 2012, p 3.14-2.

Schools

The San Francisco Unified School District (SFUSD) has a total of 102 general schools, 13 preschools and 13 charter schools. Of approximately 95,000 school-aged children in San Francisco, SFUSD had an enrollment of 52,989 students in October 2012 (SFUSD, 2013).

There are no public schools within 0.5 miles of the project area. However, the day care center at Bright Horizons/Marin Day School, Hills Plaza Campus, would be adjacent to the proposed transmission line route and near the proposed northern HDD transition area on Spear Street south of Harrison Street. This day care and preschool is licensed for 52 children from infant to four years old (MDS, 2013).

Parks

The San Francisco Recreation and Park Department builds, maintains, and renovates 4,113 acres of parks, open space, and recreation facilities in San Francisco (SFRPD, 2013). Existing parks in the vicinity of the project are also operated by the San Francisco Port Authority and the San Francisco Municipal Transportation Agency. Section 5.15 (Recreation) lists existing parks nearby to the project area, including eight existing parks and one park with recreational boater access that is within 0.75 miles of the marine segment of the project. There are no parks adjacent to the project route.

Other Public Facilities

The San Francisco Bay Trail is a bicycle and pedestrian trail that will eventually allow continuous travel around the shoreline of San Francisco Bay. Senate Bill 100, authored by then-state Senator Bill Lockyer and passed into law in 1987, directed the Association of Bay Area Governments (ABAG) to develop a plan for this "ring around the Bay," including a specific alignment for the Bay Trail. The Bay Trail Plan, adopted by ABAG in July 1989, includes a proposed alignment; a set of policies to guide the future selection, design and implementation of routes; and strategies for implementation and financing, including a trail design policy to "[i]ncorporate necessary support facilities, using existing parks, parking lots, and other staging areas wherever possible." (ABAG, 2013)

As of 2013, approximately 330 miles (530 km) of trail, over 60 percent of its ultimate length, have been completed. When finished, the Bay Trail will extend over 500 miles (805 km) to link the shoreline of nine counties, passing through 47 cities and crossing seven toll bridges. (ABAG, 2013) The project would cross under the Bay Trail as buried cable at The Embarcadero near Pier 30/32. In the area of the southern segment, the Bay Trail runs along Illinois Street adjacent to the existing Potrero Switchyard.

Applicant Proposed Measures

There are no Applicant Proposed Measures for public services.

5.14.2 Environmental Impacts and Mitigation Measures

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 public services:

a) Fire protection?

LESS THAN SIGNIFICANT. As stated in Section 4.9 (Project Overview), PG&E's primary purpose of the project would not be to increase the capacity of the system, but rather to improve transmission system reliability. The current system lacks sufficient capacity to serve current and expected future Embarcadero loads when both existing 230 kV cables into Embarcadero are out of service, for example, in the event of concurrent unplanned outages following a major seismic event, or in the event of a forced outage of one existing 230 kV cable while the other existing 230 kV cable is subject to a planned outage. PG&E states that the Proposed Project is warranted based upon the risk of an overlapping outage of both existing 230 kV Martin-Embarcadero cables; the impact that such an outage would have upon its customers in San Francisco; and the ability of the Proposed Project to mitigate the risk of outage. Thus, the Proposed Project would not induce growth in the project area.

Construction activities are not anticipated to increase the demand for fire protection services in a way that would result in the need for new or altered facilities or that would impact fire protection or fire suppression objectives. Fire risk would not be greater than at any other construction site.

Construction activities and future maintenance activities for the transmission line in the streets of San Francisco would 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 5.16, Transportation and Traffic, PG&E would coordinate any lane closures with emergency service providers so that response times would not be affected. Coordination with emergency responders would occur prior to construction, and during the construction phase, information would 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 would be kept on hand that could immediately be placed over the trench to provide access, as described in Section 4.11.2 (Traffic Controls and Lane Closures). (PG&E, 2012)

Following construction, operation of the underground and submarine transmission line and substations could result in instances requiring fire protection services. However, the project would be built to comply with CCR Sections 1250 through 1258 and would comply with CPUC General Orders (GO) 95 (Rules for Overhead Electric Line Construction) for the overhead switchyard and transmission line components, GO 128 (Rules for Construction of Underground Electric Supply and Communication Systems) for the underground transmission components and GO 165 (Inspection Cycles for Electric Distribution Facilities) for project inspection requirements for fire prevention and safety (see also Section 5.8, Hazards and Hazardous Materials). Fire risk would be comparable to that from other existing electrical infrastructure in the area, and this would not create the need for new or physically altered fire protection facilities. Impacts on local or regional fire protection would be less than significant.

b) Police Protection?

LESS THAN SIGNIFICANT. The Proposed Project would not require additional police services during construction or operation and maintenance. As with fire services discussed in Item (a) above, the construction and operation of the Proposed Project would not induce growth in the project area, would not result in a need for additional police facilities and would not affect response times or other service performance. The result would be a less than significant impact with regard to police protection.

c) Schools?

NO IMPACT. Construction and testing of the Proposed Project would last for approximately 22 months and would require a peak of about 75 construction workers (including switchyard workers, supervisors and inspectors) at any one time. Once the project is built and energized, PG&E's existing local maintenance and operations group would assume monitoring and control duties and maintenance, inspection, and security roles, as needed, with support from a marine contractor. Aside from contracted stand-by marine transportation and technical support, no additional staff would be hired by PG&E after construction is completed. In addition, as discussed in Item (a) above, the Proposed Project would not induce growth in the project area.

Because of the large available labor pool in the project area, most construction workers are expected to commute, and few construction workers are expected to temporarily or permanently relocate to the area. Since the Proposed Project would not increase the local population nor induce growth in the project area, no increase in demand for school facilities would occur, and no new school facilities would be required.

Section 5.3 (Air Quality) and Section 5.12 (Noise) address short-term construction impacts to sensitive receptors, including the day care at Bright Horizons/Marin Day School, Hill Plaza Campus. Section 4.15 provides information regarding electric and magnetic fields (EMF) associated with electric utility facilities, including PG&E's "no cost" and "low cost" magnetic field reduction steps, and the potential effects of the Proposed Project related to public health and safety.

d) Parks?

NO IMPACT. As described in Item (c) above regarding schools, the Proposed Project would not increase the region's population. While it is possible that workers traveling to the area may use existing public services or amenities such as parks, this potential increase in demand would be minimal and temporary due to the short duration of construction and small workforce. Aside from contracted stand-by marine transportation and technical support, the project would be operated using existing operation and maintenance staff, so no additional PG&E personnel would be required after construction is completed. Consequently, the project would not increase any long-term demands on existing parks in the project area, and no new or expanded park facilities would be required because the of Proposed Project.

See Section 5.15 (Recreation) for a complete discussion the Proposed Project's potential impacts to parks and other recreational facilities.

e) Other Public Facilities?

NO IMPACT. The Proposed Project would not increase population and would not affect other governmental services or public facilities so as to require new or expanded facilities be developed. The project would cross underneath and in close proximity to the San Francisco Bay Trail along The Embarcadero and Illinois Street, respectively. However, it would not preclude trail access during construction or operation and would not affect future trail design objectives, capacity or use. Therefore, no impact on other public facilities is expected.

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5.15 Recreation

RECREATION	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐
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?	☐	☐	☐	☒

Significance criteria established by CEQA Guidelines, Appendix G.

5.15.1 Setting

The Proposed Project would be located in the City and County of San Francisco between the Embarcadero Substation at the corner of Fremont and Folsom Streets and the Potrero Switchyard on Illinois Street between 22nd and 23rd Streets; see Figure 4-1 and 4-2 in Section 4 (Project Description). 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 has planned the Bay Trail, a 500-mile shoreline recreational trail. The Bay Trail is designed to have continuous waterfront access unless the shoreline location clearly conflicts with active maritime use. The Bay Trail will eventually encircle San Francisco and San Pablo Bays with a continuous network of hiking and bicycling trails. Approximately 330 miles of the Bay Trail have been completed. The project would cross under the Bay Trail as buried cable at The Embarcadero near Pier 30/32. In the area of the southern segment, the Bay Trail runs along Illinois Street adjacent to the existing Potrero Switchyard.

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 including Golden Gate Park. 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) (PG&E, 2012a). There are 560 additional acres held by various entities (PG&E, 2012a). These include campuses, pilot program schoolyards, SFPUC lands, former 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.

Table 5.15-1 lists parks that are located within one-half mile of the project area, and one park with recreational boater access that is within 0.75 mile of the underwater portion of the project. The parks are maintained by the San Francisco Recreation and Park Department, the San Francisco Port Authority, or the San Francisco Municipal Transportation Agency. The Spear Street Linear Park is located adjacent to the project corridor along Spear Street. The Spear Street Linear Park is part of the "Pavement to Parks" projects throughout the city.

Table 5.15-1. San Francisco Parks Near the Proposed Project

Park Name/Address	Owner	Amenities	Distance
South Park South Park St and Jack London Alley	San Francisco Recreation and Park Department	Picnic tables, hummingbird garden, tot lots	0.36 miles from Embarcadero Substation
Warm Water Cove Park End of 24th St and Michigan St	San Francisco Port Authority	Walking paths, open space, part of the proposed Blue Greenway Plan	0.07 miles from 23rd St underground line

Table 5.15-1. San Francisco Parks Near the Proposed Project

Park Name/Address	Owner	Amenities	Distance
Woods Yard Park Tennessee St and 22nd St	San Francisco Municipal Transportation Agency	Open space, children's sand pit	0.16 miles from Potrero Substation
Esprit Park Minnesota St and 20th St	San Francisco Recreation and Park Department	Grassy area with redwood trees and picnic tables	0.24 miles from Potrero Substation
Connecticut Friendship Garden Between 22nd and 23rd, Arkansas and Missouri Streets	San Francisco Recreation and Park Department	Community garden park	0.28 miles from Potrero Substation
Potrero Hill Recreation Center Park Arkansas St between 22nd and 23rd Streets	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 miles from Potrero Substation
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
Spear Street Linear Park	Rincon Hill	Linear park on the sidewalk of Spear Street at Harrison	Adjacent to the transmission line route

Source: PG&E, 2012a and SocketSite, 2009.

Central Waterfront Area Plan

The San Francisco General Plan and Central Waterfront Area Plan include the Eastern Neighborhoods Streets and Open Space Concept Map (adopted December 2008). The concept map shows Folsom Street as a "Civic Boulevard" and an expanded Planned Open Space area at Warm Water Cove, which would stretch south to the end of 25th Street and north to the end of 23rd Street. The expanded Planned Open Space area at Warm Water Cover would be adjacent to the HDD transition point at Potrero Substation. 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." See Section 5.10, Land Use, for additional details regarding the Proposed Project and land use plans.

Applicant Proposed Measures

There are no Applicant Proposed Measures for recreation.

5.15.2 Environmental Impacts and Mitigation Measures

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?

LESS THAN SIGNIFICANT. The project does not include development of new residential units that would increase population and would not increase the demand for parks in the project area. Project construction would result in temporary employment of up to approximately 75 construction workers. This is a 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 would be minimal and temporary.

Project construction would 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 South Beach or Islais Channel may be present in this area. Boaters and kayakers are also often present in China Basin during ballgames at AT&T Park. Disruption of water-based recreation from the work vessels would be minimal and short term. Submarine cable installation is expected to take 22 days within an approximately six-month window, and installation of the offshore to onshore transition via horizontal directional drill is expected to take 129 days during an 8-month window. The barge and tug boats that would 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. As part of standard U.S. Coast Guard in-water construction procedures, PG&E would coordinate with the U.S. Coast Guard to ensure that recreational boaters and other mariners are properly notified of construction dates and times, as described further under Section 5.15, Transportation and Traffic. The work zone would 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.

Project construction would temporarily interfere with the use of the Spear Street Linear Park. The Spear Street Linear Park vegetation may be removed during project construction and access to the park would be prohibited. This impact would be short-term in nature (less than 4 months) during excavation along Spear Street and PG&E has stated that it would restore temporarily disturbed areas to preconstruction conditions once construction is complete (Section 4.11.1, Vegetation Clearance). The northern HDD portion of the project would pass under the Embarcadero Promenade, Bay Trail, and access to The Embarcadero would not be blocked during construction. Additionally, South Park, located at South Park Street and Jack London Alley approximately 0.37 miles from Embarcadero Substation, would be open. Other than the Spear Street Linear Park, project construction would not interfere with park use or operations, or impede access to any parks. Because the impacts to the Spear Street Linear Park would be temporary in nature, it would be restored to preconstruction conditions after construction is complete, and nearby Embarcadero Promenade, Bay Trail and South Park would remain open, the impact would be less than significant. See Section 5.12, Noise for impacts due to construction noise.

Operation and maintenance of the project would not result in an increase in personnel; therefore the project would 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 Proposed 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.

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5.16 Transportation and Traffic

TRANSPORTATION AND TRAFFIC Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	☐	☐	☒	☐
b. Exceed, either individually or cumulatively, a level of service standard 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. Result in inadequate parking capacity?	☐	☐	☒	☐
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☒	☐

Significance criteria established by CEQA Guidelines, Appendix G.

5.16.1 Setting

Existing Traffic Volumes and Levels of Service

The 2011 San Francisco Congestion Management Program (SFCMP) establishes traffic level of service (LOS) standards consistent with State CMP-mandated criteria. In 1991, the SFCMP established the LOS standard at LOS E. Facilities that were already operating at a lower level of service (LOS F) at that time remain legislatively exempt from the LOS E standard. Within the Embarcadero-Potrero Project Area, Interstate 80 (I-80) between Fremont Street and U.S. Highway 101 (U.S. 101) is exempt from the LOS E standard (SFCTA, 2011).

SFCMP segments that are within a designated Infill Opportunity Zone (IOZ)[3] are also exempt from LOS conformance requirements. All local roads within the study area (Folsom Street, Spear Street, and 23rd Street) are within IOZs (SFCTA, 2011).

[3] Infill Opportunity Zones (IOZs) were designed to provide local flexibility within the state traffic requirement framework. To be deemed an infill opportunity zone, the area must meet four criteria: (1) the area must be zoned for infill residential or mixed-use development; (2) the area must be located within a 1/3 mile of a transit stop with 'frequent' service; (3) the area must be located in a county with a population of 400,000 or more; (4) infill opportunity zones can only be designated in areas where the community's general plan or specific plans calls for higher-density infill development, so that the resulting development in the infill opportunity zone will be consistent with the goals and objectives of existing planning documents (TransForm, 2013).

Highways

I-80 provides regional access to Embarcadero Substation and the northern onshore portion of the project. I-80 connects San Francisco to the East Bay via the San Francisco-Oakland Bay Bridge. I-80 and U.S. 101 provide regional access to the Peninsula/South Bay area. I-80 connects to downtown San Francisco surface streets at multiple intersections. The closest intersections to the project site occur at Fremont Street/Folsom Street, Fremont Street/Harrison Street, First Street/Harrison Street, and Essex Street/Harrison Street. I-80 is ten lanes (five lanes in each direction) across the Bay Bridge, and six to eight lanes across San Francisco. Caltrans (2011) indicates an annual average daily traffic volume of 123,000 vehicles per day on I-80 between the First Street/Harrison Street ramps and the San Francisco-Oakland Bay Bridge. According to the 2011 SFCMP, I-80 operates 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 cities to the south on the Peninsula and the greater San Jose area, serving 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) indicates an annual average daily traffic volume of 59,000 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.

Arterial Roads

The 2011 SFCMP designates Folsom Street as a two-way, four-lane, east-west, major arterial. Between First Street (to the west) and Spear Street (to the east), 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, serving as a primary eastbound connector to the I-80 freeway ramps in the South of Market area. 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 2000 Transportation Research Board, Highway Capacity Manual methodology (PG&E, 2012). The average daily traffic along Folsom Street in the eastbound direction is 15,600 vehicles per day (vpd) between Fremont Street and Beale Street (PG&E, 2012).

Folsom Street has a Class II bicycle lane (see below under Bicycle) 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, but only on the south side between Beale Street and First Street. Folsom Street has a designated bus 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.

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 (PG&E, 2012).

23rd Street is a two-way, two-lane, east-west, local road between Pennsylvania Avenue to the west and the street's eastern terminus, which is 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.

Parking Facilities

On-street parking occurs along most of the northern onshore 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 south-bound 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 Ware-house gate. On the south side, there are approximately 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 and types of vehicles used.

Mass Transit

There are no public rail lines or stations immediately along the proposed transmission line route. North of the route, there are transit lines operated by Bay Area Rapid Transit (BART), Cal Train, and SF Munic-ipal light rail service (Muni Metro) throughout downtown San Francisco and on The Embarcadero. The closest rail line to Potrero Switchyard is Muni Metro route T, 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 Ter-minal between Howard and Mission Streets and during 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 Project 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), and all bus traffic and taxi stand traffic accesses the temporary ter-minal from Folsom Street.

San Francisco Municipal Transit Agency (SF Muni Metro and Bus)

SF Muni is the transit division of the SFMTA, and provides local bus and light rail service within the project area. Seven Muni bus lines (38, 38L, 71, 71L, 76, 82X, and 108) run on the proposed northern transmis-sion line route at Folsom Street. 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 (SFMTA, 2010).

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 end of the project 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 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, 2012a).

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, 292, 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, 2011).

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.

Bicycle

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 (SFMTA, 2013).

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).

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.

Marine Navigation, Transportation, and Traffic

The bay presents a number of hazards to navigation, such as strong tides, strong currents, and variable bottom depths, all of 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.

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] 2012a). A tug escort is required for large vessels within the submarine cable area (HSC, 2012b). The project area is within the San Francisco Bay Regulated Navigation Area (RNA), as established by the U.S. Coast Guard (USCG), and vessel traffic is monitored continuously in the project area by the Vessel Traffic Service (VTS). The proposed submarine transmission line would be 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 proposed submarine route (NOAA, 2013). In addition, an expanding ferry system makes over 85,000 trips annually, 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, 2012a).

The Inland Navigation Rules Act of 1980 and International Regulations for Preventing Collisions at Sea (International Navigational Rules or 72 COLREGS) govern the "Rules of the Road" for boat traffic. Rule 9 of 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 (HSC, 2012a).

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, 2012b). 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.
- 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.

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.

Air Transportation

There are no airports or heliports within the immediate vicinity of the project. The closest airports are San Francisco International Airport and Oakland International Airport, located approximately 8.5 miles south of the project and approximately 8 miles southeast of the project, respectively. A helipad is being constructed as part of the UCSF hospital complex west of Third Street.

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs (see Table 5.16-1), as well as any adopted mitigation measures identified by this Initial Study.

Table 5.16-1. Applicant Proposed Measures (APMs) Related to Transportation

APM Number	Issue Area
	Transportation
APM 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.

5.16.2 Environmental Impacts and Mitigation Measures

a. Would the project cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?

LESS THAN SIGNIFICANT – CONSTRUCTION. Project construction would occur in a highly urbanized area and would therefore create impacts to public, private, and pedestrian transit in the project area. Some road closures and one-way traffic controls would be required to allow for certain construction activities and to maintain public safety. These closures and controls would decrease traffic flow and parking availability and potentially reduce LOS designations of streets in the project area, particularly on Folsom Street. Additionally, the proposed underground construction on Folsom Street could reduce the accessibility of the Transbay Temporary Terminal, and project construction could result in reroutes and delays of public transportation. While construction would create impacts, these impacts would be temporary in nature and would not change long-term traffic loads or patterns.

The submarine portion of the route would avoid potential conflicts with the urban arterials and public transit routes that would be affected by underground construction.

Work Areas. The width of the temporary construction work zone in public roadways would be approximately 25 feet. Open trench construction in paved roadways would be expected to proceed at approximately 150-300 linear feet per day. As identified in APM TR-1, steel plating would be placed over the trench to allow vehicular and pedestrian access to areas 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 vault and boring locations. Equipment and vehicles generally would park on the street opposite the trench. Construction zones would occur entirely within the paved portion of City streets, and PG&E does not propose any sidewalk closures except for access to the Potrero Switchyard on the north side of 23rd Street, and the sidewalk may be temporarily closed along the south side of Folsom Street where the line would exit Embarcadero Substation. Traffic controls would also be implemented to direct local traffic safely around the work areas. PG&E would apply for a Special Traffic Permit from the SFMTA, which will include a Traffic Management Plan as part of the application, as detailed in APM TR-1.

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 First Street
- 23rd Street from Illinois Street to the DHL Warehouse gate

In addition, the following roadways would be crossed by the Proposed Project route and may experience lane closures when transmission line construction occurs within the intersections along the Proposed Project route:

- Harrison Street
- Main Street
- Beale Street
- Fremont Street

Work areas would be temporary in nature, and impacts would not persist once construction is complete.

Staging Areas and Yards. Construction would involve use of equipment staging sites, laydown yards, equipment and material storage areas, and areas to temporarily store excavated materials near the substations and land routes; see Figure 4-5 (PG&E, 2013). Commercially available off-site office and yard space may also be used. Traffic associated with use of these areas would be temporary in nature, and impacts would not persist once construction is complete.

HDD Transition Areas. Horizontal direction drilling, or HDD, is proposed at both the northern and southern transition areas from the onshore to marine segments. The work area for the northern HDD landing site would be approximately 500 feet by 60 feet between Harrison Street and the Spear Street cul-de-sac, and cable pulling would occur in areas 75 feet by 12 feet at manholes spaced 1,800 feet apart. The use of HDD would ensure that vehicle, rail, bicycle, and pedestrian traffic along The Embarcadero would not be disrupted during construction. The work area for the southern HDD landing site would be 800 feet by 50 feet along 23rd Street, and an additional 800 feet of 23rd Street would be used for staging, which would extend the temporary lane closure and loss of parking between Illinois Street and the shoreline. Traffic would be disrupted, but very low levels of traffic occur in the vicinity of the proposed HDD activities. At both northern and southern HDD transition areas, excavation for bore pits and splice vaults would require a work zone to be closed to the public for approximately six weeks.

The northern submarine/underground transition landing zone would be located on the easternmost block of Spear Street, which dead-ends directly underneath the Bay Bridge (I-80). This block of Spear Street is a cul-de-sac with no through traffic. The proposed location of the northern HDD transition and bore pit would be configured 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 would be closed during the HDD construction.

The southern submarine/underground transition landing zone would be located in 23rd Street approximately 200 feet from shore, near the DHL Warehouse, in an area with no through traffic. The southern HDD transition and work zone would not block access for DHL Warehouse employees or trucks. The temporary lane closures and the increased disruption to vehicles, bicyclists, and transit riders as a result of these closures would be reduced to a less-than-significant level by the implementation of APM TR-1.

Lane Closures due to Trenching. The trenching work on both the northern and southern underground segments would occupy approximately 1,500 feet of street lane at any time during which the lane would be closed to traffic along that distance. Trenching would progress at an approximate rate of 50 feet per day. The total surface of the trench plates over backfilled areas would vary between approximately 100 to 500 feet in length each day until it has reached a surface large enough (typically 300 feet) for efficient pavement restoration. Trench paving is planned to occur once a week to minimize the amount of trench plates on the road. The total duration of trench excavation and manhole installation is estimated to take approximately four months along the northern underground segment, and two months along the southern underground segment. Lane closures would also be required for 13 days at <u>each</u> of the seven vault locations, including one in Folsom Street between Fremont and Main Streets, and three at each HDD transition in Spear Street and 23rd Street.

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 would be required.

Final pavement restoration would be scheduled after the cable is fully installed and operative. The City would require a full lane of pavement restoration which in turn would require a two lane closure over a 1,500-foot work area. Final paving would take one week to complete the northern underground segment and two days to complete the southern underground segment.

Folsom Street between Spear Street and First Street is a two-way roadway, with three travel lanes eastbound and one travel lane westbound. Since final design is ongoing, PG&E has not specified whether the north or south the side of Folsom Street would 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 First 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 First 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 less than significant with the implementation of APM TR-1, which would ensure the following, among other requirements in a Traffic Management Plan that would be approved as part of PG&E's Special Traffic Permit from SFMTA: coordination of bus stop relocation (as necessary); identification of all access and parking restrictions and signage requirements, including any bicycle route or pedestrian detours; plan for notifications and a process for communicating with affected residents and businesses; coordination with emergency service providers and assurance that all roads shall remain passable to emergency service vehicles at all times; requirement that all open trenches be covered with metal plates at the end of each workday to accommodate traffic and access; and development of circulation and detour plans to minimize impacts to local street circulation.

Marine Traffic. During the construction of the underwater portion of the transmission line, a cable-laying barge positioned by tugboats would be present on the bay surface above the submarine route. Barges have right-of-way under maritime rules because of their limited maneuverability. Typically, the barge would be pulled into position via commercial tugboats, and the barge anchors would 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.) The proposed submarine route would be nearer to shore than and located west of the established north/south shipping lanes used by commercial and naval traffic, and designated anchorage areas are located east and southeast of the proposed submarine route. As a result the project would have no effect on the shipping lanes or anchorage areas.

Crews would need to board crew boats from an existing commercial marina (e.g., at the Port of Oakland or 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 would be directed daily regarding anchoring locations via the Vessel Traffic Service of San Francisco and the USCG. Specific anchoring points or locations would become known during project implementation.

The current schedule estimate would be for offshore cable-laying activities to occur over a six-month time period. The actual duration of the cable laying would 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 would be present for a few weeks. Vessels and equipment, including dive boat and divers, would 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. The pipe and casing of the HDPE conduit would be connected to a small boat and dragged from 23rd Street until the pipe is floating on the water, and tugged along the surface of the water to each HDD exit. These activities and all vessel operations would need to comply with applicable navigational codes and standards. The operation would be coordinated with VTS, a Vessel Safety Zone would be established, and movements would be coordinated with and monitored by the VTS. The VTS Notices to Mariners would be used to continuously advise vessel operators of the cable laying operation. Vessels involved in the cable laying would operate according to 72 COLREGS.

The measures included in APM TR-2 above, include coordination with USCG to establish a Vessel Safety Zone, and also to provide information on the cable laying work for dissemination by the USCG to mariners and other parties. Discussions with USCG personnel in July 2012, confirm that coordination between PG&E and the USCG, as required under APM TR-2, would avoid any conflicts with preexisting or ongoing dredging, passenger ferry service to/from China Basin (for San Francisco Giants home games), as well as with other marine traffic, including recreational boats, commercial and sport fishing boats, board sailors, and personal watercraft (jet skis). Given the lack of potential conflict with shipping lanes and anchorage areas, the planned coordination with VTS and USCG under APM TR-2, short-term construction impacts to marine traffic would be less than significant.

NO IMPACT – OPERATION AND MAINTENANCE. To facilitate proper equipment operation and safety for the new and existing facilities, current project operation and maintenance activities would continue at Embarcadero Substation and Potrero Switchyard. A Distributed Temperature Sensing system of fiber optics integrated in the body of the cable would be used to monitor the submarine and underground cable on a routine basis. Aside from contracted stand-by marine transportation and technical support, no additional staff would be hired by PG&E after the transmission project is energized and placed into service. No substantial increase in traffic or traffic-related impacts would occur due to operation and maintenance activities.

b. Would the project cause, either individually or cumulatively, a level-of-service standard established by the county congestion management agency for designated roads or highways to be exceeded?

LESS THAN SIGNIFICANT – CONSTRUCTION. Construction-related traffic would be temporary and therefore would not result in any long-term degradation in operating conditions or LOS on any 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. However, the majority of the Proposed Project route would be located near and on major arterials where occasional slow or larger turning radius movements would not substantially diminish the level of service.

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; worker travel from off-site office and yard sites to the project 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 onshore 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 for traveling to and from each work site would not exceed about 40 round trips (80 one-way trips) per day.

Construction would typically occur between 7 a.m. and 8 p.m., or during times set by the SFDPW in the Excavation Permit. If trenching work could cause traffic congestion, the City may require nighttime work to minimize traffic disruption.

According to the 2011 SFCMP, eastbound Folsom Street between First 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. However, all local roads within the study area, including the affected segment of Folsom Street, are defined in the 2011 SFCMP as being within an Infill Opportunity Zone, and therefore exempt from LOS standards. With coordination of activities through the SFDPW and SFMTA reviews, the potential impact of adversely affecting the roadway LOS in during project construction would be less than significant.

NO IMPACT – OPERATION AND MAINTENANCE. To facilitate proper equipment operation and safety for the new and existing facilities, current project operation and maintenance activities would continue at Embarcadero Substation and Potrero Switchyard. No new staff would be required for maintenance or operations at the new Potrero Switchyard or at Embarcadero Substation or along the underground transmission line segments; therefore there would be no impacts to any roadway LOS.

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 would occur as a result of the project, so there would 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 because of a design feature or incompatible uses?

LESS THAN SIGNIFICANT – CONSTRUCTION. Heavy equipment operating adjacent to or within a road right-of-way could increase the risk of accidents. Construction-generated trucks on the affected city streets would interact with other vehicles, and potentially create hazards. Potential conflicts also could occur between construction traffic and bicyclists and pedestrians, and potential short-term hazards could be associated with temporary lane closures during construction. Construction traffic related impacts would be reduced with implementation of APM TR-1. Under APM TR-1, PG&E would: coordinate construction traffic access at Embarcadero Substation and Potrero Switchyard with SFMTA during project construction; follow the recommendations in the California Joint Utility Traffic Control Manual (2010) regarding basic standards for the safe movement of traffic on highways and streets; apply for an Excavation Permit and a Special Traffic Permit from the City of San Francisco. PG&E would submit a Traffic Management Plan to the City as part of its Special Traffic Permit application, which would include required elements, such as: coordination with the City; notification processes for affected residents and businesses; notification of emergency service providers of the timing, location, and duration of construction activities; requirement for roads to remain passable to emergency service vehicles at all times; and circulation and detour plans to minimize impacts to local street circulation. The Proposed Project would not involve any new permanent design features that would be hazardous or incompatible because, upon completion, the cable would be underground.

To avoid creating hazards within franchise in city streets and areas owned by Caltrans (for the portion under the Bay Bridge), PG&E would obtain all necessary road encroachment permits prior to construction and would comply with all the applicable conditions of approval. PG&E's 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.

NO IMPACT – OPERATION AND MAINTENANCE. An entrance to the new Potrero Switchyard would be constructed off 23rd Street. This entrance would be constructed in the middle of the block on a straight street with very low traffic. Because it would be used infrequently and not cause substantial disruption to existing traffic, it would not create a hazard, and there would be no impact.

The proposed submarine route would be closer to shore and west of the established north/south shipping lanes used by commercial and naval traffic, and designated anchorage areas are located east and southeast of the proposed submarine route. As a result the project would have no effect on the shipping lanes or anchorage areas. Additionally, the cable would be buried under seafloor sediments, so it would not create a hazard or otherwise impact other marine traffic in the area.

e. Would the project result in inadequate emergency access?

LESS THAN SIGNIFICANT. Routes for emergency vehicles would be maintained throughout project construction, as required in APM TR-1. 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). PG&E would minimize this potential impact through notifications to emergency service providers and other measures included in APM TR-1, and incorporated in PG&E Traffic Management Plan that is part of PG&E's Excavation Permit and Special Traffic Permit approved by the City of San Francisco. Implementation of APM TR-1 would ensure that this impact would be less than significant.

f. Would the project result in inadequate parking capacity?

LESS THAN SIGNIFICANT. Construction of the project could result in closure of parking spaces on Spear Street, Folsom Street, and 23rd Street. These closures would be temporary in nature and would not constitute a long-term loss of parking capacity. Closures would not occur simultaneously, and specific closure areas would be related to the rate of in-street construction. The number of parking closures at a given time would be very small relative to the parking capacity in the Rincon Hill and Central Waterfront areas. Parking capacity would return to normal conditions once project construction is complete.

As specified under APM TR-1, PG&E would obtain all necessary road permits prior to construction and would comply with all the applicable conditions of approval. PG&E would notify affected residents and businesses of construction and road/parking closures prior to construction, and PG&E would provide a toll-free telephone number for receiving questions or complaints during construction. Temporary parking closures would also be signed appropriately, as required in PG&E's Traffic Management Plan (to be prepared in consultation with the City) Short-term impacts to parking capacity would be less than significant.

g. Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

LESS THAN SIGNIFICANT. The Class II bike lane along Folsom Street from First Street to Spear Street would be temporarily affected by project construction. Lane closures could temporarily detour bikeways, but impacts related to construction would be short-term and temporary. Alternate bike routes are available nearby on Market Street and Townsend Street.

The Proposed Project would have no permanent impact on alternative transportation. Construction zones would occur entirely within the paved portions of streets, and PG&E does not propose any sidewalk closures except for access to the Potrero Switchyard. Project construction would cause disruptions to bus access to and from the Transbay Temporary Terminal at Folsom Street between Main Street and Beale Street. Golden Gate Transit, AC Transit, Greyhound, WestCAT, SF Muni, and SamTrans currently use the Transbay Temporary Terminal. Bus routes on streets would need to be temporarily and slightly detoured around work crews. The following SF Muni lines currently run on Folsom Street in the project area: 38, 38L, 71, 71L, 76, 82X, and 108. There is one bus stop along the proposed underground construction route at Folsom Street between Main Street and Beale Street in the eastbound direction, which serves SamTrans lines KX, 292, 391, and 397. This bus stop may need to be temporarily relocated. Although 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, once construction becomes complete, buses and other public transit options would operate as normal.

As specified under APM TR-1, PG&E would obtain all necessary road permits prior to construction and would comply with all the applicable conditions of approval. PG&E's Traffic Management Plan (to be prepared in consultation with the City) would establish methods for minimizing construction effects on transit service and bike facilities to ensure that this impact would be less than significant.

5.17 Utilities and Service Systems

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 stormwater 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?	☐	☐	☐	☒
h. Would the project disrupt the existing utility systems or cause a collocation accident?	☐	☒	☐	☐

Significance criteria for questions (a) through (g) established by CEQA Guidelines, Appendix G.

5.17.1 Setting

The Proposed Project would be located within the highly urbanized City and County of San Francisco and in the San Francisco Bay.

On shore, the Proposed Project would include 0.6 miles of underground transmission line installed using open trenching from Embarcadero and Potrero Substations to the landing point for the submarine cable. There would also be 0.2 miles of horizontal directional drilling at either end (0.4 miles total) where the submarine cable would transition from onshore to offshore. Underground utilities that may be encountered during these segments include buried water lines, combined storm drains/sanitary sewers, telephone, cable, fiber optic cable, natural gas, electric traffic loops, and electrical distribution lines. Overhead utilities include telephone, cable, and electrical distribution and transmission lines.

The 2.5-mile marine portion of the project would be installed underneath the seafloor parallel to the Trans Bay Cable. No other utilities were identified during PG&E's preliminary engineering in the submarine portion of the project (PG&E, 2012).

Utility services and providers are shown in Table 5.17-1 and discussed below.

Table 5.17-1. Local Utility and Service Providers

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 ▪ Trans Bay Cable – City of Pittsburg

Source: PG&E, 2012.
*Proposed landfill contract is currently under environmental review in response to several legal challenges (Sabatini, 2012).

Utilities

Electricity and Natural Gas

Electrical and natural gas services within the City and County of San Francisco are provided by PG&E and San Francisco Public Utilities Commission (SFPUC). Additionally, electricity is imported into PG&E's system from the City of Pittsburg via the Trans Bay Cable (Figure 4-2).

Water Supply

The SFPUC is a department of the City and County of San Francisco that provides drinking water, stormwater, and wastewater services to San Francisco. SFPUC's regional water system consists of three integrated water supply and conveyance systems: Hetch Hetchy, Alameda, and Peninsula systems. The SFPUC provides potable water to 2.6 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, 2013a).

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 (PG&E, 2012). Additionally, the SFPUC operates a recycled water truck-fill station at the Southeast Water Pollution Control Plant that provides recycled water for dust control and soil compaction activities at no charge (SF Planning, 2012).

Service Systems

Wastewater and Stormwater

Ownership of the separate storm sewer system within the City and County of San Francisco is divided between the Port of San Francisco (for areas along the City waterfront) and Wastewater Enterprise, a branch of the SFPUC, for all other areas within the City's jurisdiction. Although the Port of San Francisco and the SFPUC administer their stormwater programs separately, they coordinate on issues of mutual concern and have entered into a Memorandum of Understanding for stormwater management and other water quality issues (Port of San Francisco, 2003).

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 where water is treated prior to discharge to San Francisco Bay or the Pacific Ocean. The SFPUC's Wastewater Enterprise operates and maintains 993 miles of combined sewers, and operates storage facilities and three treatment plants. The City of San Francisco completed a Sewer System Master Plan in 2010 that assesses the current situation and provides a framework for future actions (SFPUC, 2010a). The Master Plan envisions retaining the existing combined storm and wastewater sewer system.

Large underground transport /storage boxes 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 10 times per year (SFPUC, 2013b).

About 10 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)[3] or the Port of San Francisco for areas along the City waterfront. The Port of San Francisco operates a separate storm sewer system under an independent Stormwater Management Program developed in 2003 (Port of San Francisco, 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. (PG&E, 2012)

Wastewater

There are three wastewater treatment plants in the City that are operated by the SFPUC. During dry weather, the Southeast Water Pollution Control Plant (WPCP) and the Oceanside WPCP provide primary and secondary treatment, and the North Point Facility can provide primary treatment during wet weather, as described below (SFPUC, 2010b):

- *Southeast WPCP* is located at 750 Phelps Street and treats 76 percent of the average annual wastewater flows. On average it provides secondary treatment for 63 mgd during dry weather, and is designed for an average of 85.4 mgd. Treated effluent is discharged 800 feet into San Francisco Bay.
- *Oceanside WPCP* is located at 3500 Great Highway and treats 20 percent of the average annual wastewater flows. 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.

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3 An MS4 is a conveyance or system of conveyances that is: (1) Owned by a state, city, town, village, or other public entity that discharges to waters of the U.S.; (2) Designed or used to collect or convey stormwater (including storm drains, pipes, ditches, etc.); (3) Not a combined sewer; and (4) Not part of a Publicly-Owned Treatment Works (sewage treatment plant). Polluted stormwater runoff is commonly transported through MS4s, from which it is often discharged untreated into local waterbodies. To prevent pollutants from being washed or dumped into an MS4, operators (e.g., City and County of San Francisco) must obtain a National Pollutant Discharge Elimination System (NPDES) permit and develop a stormwater management program for its stormwater discharges. (USEPA, 2013)

- *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. The facility operates on average 30 times per year (450 hours) and treats an annual average wet-weather flow of 0.7 billion gallons (4 percent of the average annual citywide wastewater flow). Treated effluent is discharged 800 feet into San Francisco Bay.

Storm and wastewater from the project area would be collected and discharged to the Southeast WPCP, or to the bay, as described above under overflow conditions.

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 80 percent of San Francisco's waste is diverted from the landfill (Recology, 2013). Waste is hauled to the San Francisco Dump, the local transfer station at 501 Tunnel Avenue, which is approximately four miles south of Potrero Switchyard.

There are no active solid waste disposal facilities in San Francisco. Waste is hauled by truck from the San Francisco Dump transfer station to Waste Management's Altamont Landfill, which has permitted disposal capacity through the year 2025. The City and County of 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 in Livermore, California (Waste Management, 2013).

In 2011, San Francisco signed a contract with Recology beginning after 2015 for waste to be landfilled via rail to Recology Ostrom Road Landfill, located in Wheatland, Yuba County. Recology Ostrom Road Landfill has a total design capacity of over 43 million cubic yards, has an expected closure date of 2066 and can accept up to 3,000 tons of municipal solid waste per day (CalRecycle, 2013). However, the 10-year $112 million contract has been challenged by three separate lawsuits, including one by Waste Management, Inc., alleging improper biding and inadequate environmental review. In response, in November 2012, Recology and the City agreed to terminate the agreement, which would effectively end the legal challenges, and share the costs of an environmental review of the proposed contract, which is expected to take a year (Sabatini, 2012).

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 (PG&E, 2012).

Communications

Telecommunication services are primarily provided by SBC/AT&T, with a wide range of other service providers in the market for wireless and long-distance services.

Applicable Regulations

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 and use of reclaimed water is provided for informational purposes.

State

California Government Code – Protection of Underground Infrastructure. The responsibilities of California utility operators working in the vicinity of utilities are detailed in Section 1, Chapter 3.1, "Protection of Underground Infrastructure" (Article 2 of California Government Code §§4216-4216.9). This law requires that an excavator must contact a regional notification center at least two days prior to excavation of any subsurface installation. Any utility provider seeking to begin a project that may damage underground infrastructure can call Underground Service Alert, the regional notification center. Underground Service Alert will notify the utilities that may have buried lines within 1,000 feet of the project. Representatives of the utilities are required to mark the specific location of their facilities within the work area prior to the start of project activities in the area. The code also requires excavators to probe and expose underground facilities by hand prior to using power equipment.

California Integrated Waste Management Board Solid Waste Policies, Plans, and Regulations. The Integrated Waste Management Act of 1989 (PRC 40050 et seq. or Assembly Bill (AB 939, codified in PRC 40000), administered by the California Integrated Waste Management Board (CIWMB), requires all local and county governments to adopt a Source Reduction and Recycling Element to identify means of reducing the amount of solid waste sent to landfills. This law set reduction targets at 25 percent by the year 1995 and 50 percent by the year 2000. To assist local jurisdictions in achieving these targets, the California Solid Waste Reuse and Recycling Access Act of 1991 (SWRR) requires all new developments to include adequate, accessible, and convenient areas for collecting and loading recyclable and green waste materials.

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.

Under Ordinance 175-91, non-potable water must be used for dust control and soil compaction activities during project construction if required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code (SFPUC, 1991). The SFPUC operates a recycled water truck-fill station at the Southeast Water Pollution Control Plant that provides recycled water for these activities at no charge (SF Planning, 2012).

San Francisco Construction and Demolition Waste Ordinance (Ordinance 27-06). In 2006, the City adopted Ordinance No. 27-06 mandating the recycling of construction and demolition debris. 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. (CCSF, 2006)

San Francisco Mandatory Recycling and Composting Ordinance (Ordinance 100-09). In 2009, the City adopted the Mandatory Recycling and Composting Ordinance (No. 100-09) requiring recycling separate bins for recyclables, compostables, and trash (CCSF, 2009).

San Francisco Green Building Ordinance (San Francisco Building Code 13C). 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 (CCSF, 2010).*

Applicant Proposed Measures

PG&E proposes to implement measures during the design, construction, and operation of the Proposed Project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the Proposed Project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study (see Table 5.17-2).

Table 5.17-2. Applicant Proposed Measures (APMs) Related to Utilities and Service Systems

APM Number	Issue Area
	Utilities and Service Systems
APM 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.
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.

Table 5.17-2. Applicant Proposed Measures (APMs) Related to Utilities and Service Systems

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), 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 PEA Section 3.9, Hydrology and Water Quality. ▪ Stopping work at that location and contacting the CUPA (SFDPH Environmental Health Section; see PEA 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. *(Also see APM WQ-1 and APM WQ-3 in PEA Section 3.9.4.2)*

Table 5.17-2. Applicant Proposed Measures (APMs) Related to Utilities and Service Systems

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. 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 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.

5.17.2 Environmental Impacts and Mitigation Measures

a. Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

LESS THAN SIGNIFICANT – CONSTRUCTION. The project area would be served by the Southeast WPCP via the combined storm and sanitary sewer system. Wastewater services would also be provided to project construction workers by portable toilets. Waste would be disposed of at appropriately licensed off-site facilities. Given the limited construction crew of no more than 75 personnel, the amount of effluent generated by the crew would not cause wastewater treatment plants to exceed treatment capacity.

PG&E would apply for a National Pollutant Discharge Elimination System (NPDES) 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 would 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 would be obtained, as required by the construction contractor, and water disposed of in accordance with State and federal standards. The project would not discharge trench water to the combined system during significant rainfall events. (PG&E, 2012)

Wastewater treatment requirements of the Regional Water Quality Control Board would not be exceeded and impacts would be less than significant. Additional discussion regarding potential impacts to groundwater is included in Section 5.9, Hydrology and Water Quality.

NO IMPACT – OPERATION AND MAINTENANCE. Operation and maintenance of the project would not generate wastewater; therefore, no impacts would occur.

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?

LESS THAN SIGNIFICANT – CONSTRUCTION. Water would be used for dust control, as discussed in Section 5.3, Air Quality, and Item (d) below. Per City of San Francisco Ordinance 175-91, construction projects are required to use recycled water for dust control activities. Although PG&E is exempt from this ordinance because the City does not have discretionary authority over the project, the project would source recycled water from the City of San Francisco's No. 3 Bulk Water Distribution Facility, located in the southeastern part of the City. The City's supply of recycled water varies from day to day, depending on whether Water Distribution Facility staff is using recycled water to clean on-site equipment, or if all recycled water is made available to outside users. Therefore, it is not possible for the City staff to quantify the amount of recycled water available at any time with absolute certainty. Nevertheless, given the relatively small amount of recycled water required by the Proposed Project, the Water Distribution Facility would be capable of meeting the project's construction demand on any given day (PG&E, 2013). Therefore, water would be obtained from existing supplies and would be sufficient for construction needs.

Wastewater service would be provided by portable toilets, and waste disposal will occur at appropriately licensed facilities offsite (PG&E, 2012). The minimal amount of effluent generated by construction workers would not cause a wastewater treatment plant to exceed its treatment capacity. Trench water would be disposed of as described in Item (a) to the combined system or hauled offsite to an appropriate disposal facility.

The project would not require the construction of new or the expansion of existing water facilities. Therefore, there would be no impacts to water or wastewater treatment facilities resulting in the need for new or expanded facilities.

NO IMPACT – OPERATION AND MAINTENANCE. Once operational, the new Potrero 230 kV Switchyard would not require a potable water source or a connection to the sewer system. Monitoring and control functions for the Proposed Project would be connected via telecommunications to PG&E's existing systems. Once the project is built and energized, PG&E's existing local maintenance and operations group would assume monitoring and control duties and maintenance, inspection, and security roles, as needed, with support from a marine contractor. Aside from contracted stand-by marine transportation and technical support, no additional staff would be hired by PG&E for operations and maintenance. Consequently, operation of the Proposed Project would not result in impacts to water or wastewater or require additional 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?

LESS THAN SIGNIFICANT. The proposed underground transmission line would feature an 11-foot burial depth, which would generally allow the cable to clear all other utilities in the right-of-way, with the exception of two large storm sewers at the following locations: (1) in the intersection of Spear and Folsom; and (2) at the end of the route as it turns to enter the Embarcadero Substation. In both cases, PG&E has stated that the trench would be lowered sufficient additional depth to clear the sewer. (PG&E, 2013)

Additionally, one of the SFPUC's storage/transport boxes underlies The Embarcadero where the project's north end would cross as an HDD. Implementation of APM UTIL-1 would ensure that the HDD depth is coordinated with SFPUC so that the project is designed to avoid impacts to the box. Construction of the Proposed Project could temporarily accelerate sedimentation and reduce surface water quality by disturbing the immediate area of the on shore transmission line route and substations. Stormwater drainage features at the existing substations, along with the construction best management practices (BMPs), such as the Stormwater Pollution Prevention Plan that would be developed per APM WQ-1, would manage project-related stormwater without using off-site facilities. The Proposed Project would not require the construction of new stormwater drainage facilities or expansion of existing facilities. Because no new or expanded drainage facilities would be required for the project, this impact would be less than significant.

d. Would the project have sufficient water supplies available to serve the Proposed Project from existing entitlements and resources, or would new or expanded entitlements be needed?

LESS THAN SIGNIFICANT – CONSTRUCTION. The primary need for water would be construction-related dust control activities and would be dependent upon the activity, season and weather. As described in detail in Section 5.9, Hydrology and Water Quality, water would be trucked in as needed. PG&E has estimated that project construction activities would typically require the use of two 2,000-gallon truckloads of water for dust control per day of construction (PG&E, 2013). Recycled water would be used if feasible, as discussed in Item (b). Water for the HDD operations would potentially be taken from a City hydrant under a permit with the City. Potable water for construction workers would likely be brought in on construction vehicles.

The SFPUC provides potable water to 2.6 million customers in the Bay Area. 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, 2013a).The minimal water needed for dust control and construction crew consumption would not exceed available supplies. Sufficient existing water supplies are available; therefore, impacts would be less than significant.

NO IMPACT – OPERATION AND MAINTENANCE. Operation and maintenance would not require additional water supplies and would not result in any impacts.

e. Would the project result in a determination by the wastewater treatment provider that serves or may serve the Proposed Project that it has adequate capacity to serve the Proposed Project's projected demand in addition to the provider's existing commitments?

LESS THAN SIGNIFICANT – CONSTRUCTION. The Proposed Project would require portable toilets for construction workers. Sanitary waste would be disposed of at appropriately licensed official facilities with adequate capacity. Trench water would be disposed of as described above to the combined SFPUC system or hauled offsite to an appropriate disposal facility. As discussed in Item (a) above, existing wastewater facilities would adequately accommodate the minor demand caused by project construction while serving existing commitments. Therefore, this impact would be less than significant.

NO IMPACT – OPERATION AND MAINTENANCE. Operation and maintenance activities would not create increased wastewater. No impacts would occur.

f. Would the project be served by a landfill with sufficient permitted capacity to accommodate the Proposed Project's solid waste disposal needs?

LESS THAN SIGNIFICANT – CONSTRUCTION. An estimated 6,300 cubic yards of excavated material from the transmission line trench and vault locations and the HDD entry pits would be hauled off-site for disposal to an appropriately licensed facility or hauled to a commercial soil recycling facility. Grading and excavation for construction of the new Potrero 230 kV Switchyard would require removal of up to 8,000 cubic yards of soil that is known to be contaminated. As also discussed in Section 5.8 (Hazards and Hazardous Materials), implementation of APM HM-1 (Implementation of Hazardous Material and Emergency Response Procedures) would ensure proper disposal at a licensed waste 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 the construction sites. Under APM GHG-1, PG&E would encourage the recycling of construction waste where feasible. Additionally, under APM HM-1, all hazardous materials and hazardous wastes, including any contaminated soil, would be handled, stored, and disposed of in accordance with all applicable regulations, by personnel qualified to handle hazardous materials. All project APMs appear in Table 4-5.

Waste would be hauled from the San Francisco Dump to Altamont Landfill, which has a permitted disposal capacity through the year 2025. San Francisco currently has a contract with Waste Management to use Altamont Landfill that is set to expire in 2015. Construction of the Proposed Project is expected to be completed by December 2015. The proposed contract for after 2015 is currently undergoing environmental review, which is expected to be completed in a year. Under the future contract, waste may be landfilled via rail at Recology Ostrom Road, a landfill owned by Recology located in Yuba County (Sabatini, 2012). Recology Ostrom Road has a total design capacity of over 41 million cubic yards and can accept up to 3,000 tons of municipal solid waste per day (CalRecycle, 2013). The landfills serving the project area would have adequate capacity for the expected waste. Therefore, impacts would be less than significant.

NO IMPACT – OPERATION AND MAINTENANCE. Operation and maintenance would generate minimal waste, and no impacts are expected to occur.

g. Would the project comply with federal, state, and local statutes and regulations related to solid waste?

NO IMPACT. The California Integrated Waste Management Act of 1989, which emphasizes resource conservation through reduction, recycling, and reuse of solid waste guide solid waste management requires that localities conduct a Solid Waste Generation Study (SWGS) and develop a Source Reduction Recycling Element (SRRE). The Proposed Project would operate in accordance with these applicable Solid Waste Management Policy Plans and would include PG&E's existing recycling program for underground construction in San Francisco and operation of the existing Potrero Switchyard and Embarcadero Substation. Under APM GHG-1, PG&E would encourage the recycling of construction waste where feasible. Additionally, under APM HM-1, all hazardous materials and hazardous wastes, including any contaminated soil, would be handled, stored, and disposed of in accordance with all applicable regulations, by personnel qualified to handle hazardous materials. All project APMs appear in Table 4-5.

As identified in Item (f) above, the landfill serving the site would have sufficient capacity to accommodate project construction solid waste disposal needs, and project solid waste disposal would not require the need for new or expanded landfill facilities. Therefore, the Proposed Project would comply with federal, State, and local statutes and regulations related to solid waste disposal limits and landfill capacities. No impact would occur.

h. Would the project disrupt the existing utility systems or cause a collocation accident?

LESS THAN SIGNIFICANT WITH MITIGATION. Construction of the Proposed Project has the potential to disrupt existing collocated utility lines during underground and submarine construction. As discussed in Section 4.11.5, where the electrical transmission duct bank would cross or run parallel to other substructures (which have operating temperatures at earth temperature), a minimum radial clearance of 12 inches would be required. These substructures include gas lines, telephone lines, water mains, storm lines, and sewer lines. In addition, a 5-foot minimum radial clearance would be required where the new duct bank crosses another heat-radiating substructure at right angles. A 15-foot minimum radial clearance would be required between the duct bank and any parallel substructure whose operating temperature significantly exceeds the normal earth temperature. Such heat-radiating facilities may include other underground electric transmission circuits, primary electric distribution cables (especially multiple-circuit duct banks), steam lines, or heated oil lines. Clearances and depths would meet requirements set forth with Rule 33.4 of CPUC General Order 128 (Rules for Construction of Underground Electric Supply and Communication Systems).

PG&E stated that its engineering team has taken into consideration the location of other underground utilities in defining feasible routes for the underground portion of the project and the project would be designed to have no permanent impact on power, natural gas, communications systems, or any other utilities that are specifically documented (PG&E, 2012). The Proposed Project would include an 11-foot burial depth, which would generally allow the cable to clear all other utilities in the right-of-way, with the exception of two large storm sewers at the following locations: (1) in the intersection of Spear and Folsom; and (2) at the end of the route as it turns to enter the Embarcadero Substation. In both cases, PG&E has stated that the trench can feasibly be lowered sufficient additional depth to clear the sewer (PG&E, 2013). To prevent damage to SFPUC stormwater facilities, PG&E would work with the San Francisco Department of Public Works, through the Excavation Permit process, and the SFPUC to establish an appropriate shoring plan, work zone restrictions, or setbacks for adjacent structures.

Table 5.17-3 lists the documented natural gas transmission lines (gas transmission operates at a pressure greater than 60 pounds per square inch) that are in or near the streets of the proposed underground route. The proposed 230 kV transmission line would cross or pass within several feet of eight gas transmission lines, several of which would be paralleled or crossed more than once.

Table 5.17-3. Existing Gas Transmission Lines Near the Proposed Route

Proposed Alignment	Existing Gas Transmission Lines*
Downtown San Francisco Area – Northern Underground Segment	
Spear Street between The Embarcadero and Harrison Street	▪ 2” transmission (parallel)
Spear Street at Harrison Street	▪ 2” transmission (parallel; same as 2” pipe at Spear Street between The Embarcadero and Harrison Street) ▪ 4” transmission (crossing)

Table 5.17-3. Existing Gas Transmission Lines Near the Proposed Route

Proposed Alignment	Existing Gas Transmission Lines*
Spear Street at Folsom Street	▪ 4" transmission (parallel; same as 4" pipe at Spear Street and Harrison Street) ▪ 4" transmission (crossing; same as 4" pipe at Spear and Harrison) ▪ 2" transmission (parallel)
Folsom Street at Fremont Street	▪ 3' transmission (crossing)
Folsom Street between Freemont Street and Embarcadero Substation	▪ 16" transmission (crossing)
Potrero Switchyard Area – Southern Underground Segment	
23rd Street from the San Francisco Bay	▪ 30" transmission (parallel)
23rd Street to Potrero Substation	▪ 30" transmission (parallel; same as 30" pipe at 23rd Street from the Bay) ▪ 24" transmission (crossing)

Source: PG&E, 2013.
* There are no gas distribution lines in the project area.

Additionally, due to utility congestion along the northern underground segment, a two-step analysis was performed to establish that there would be sufficient space in Spear and Folsom Streets to install an 11-foot-deep duct bank (B&V, 2012). First, PG&E obtained preliminary as-built drawings from the San Francisco Department of Public Works based on a recent City sewer replacement and repaving project in Spear Street. The City sewer project began at the dead end cul-de-sac on Spear Street, at the northern HDD landing area for the Proposed Project. The proposed alignment is based on these drawings and takes into account EMF policy goals (see Section 4.15) while avoiding conflicts with the existing utilities. (PG&E, 2013)

Secondly, along Folsom Street, PG&E conducted a visual survey of existing utilities as evidenced by their existing vaults. The survey concluded that the intersections of Folsom Street with Spear Street and with Main Street are crowded with utilities. However, PG&E has stated that there is enough room to install the duct bank between the existing utilities at a depth of 11 feet along the west side of Folsom Street (B&V, 2012; PG&E, 2013). Undocumented obstacles could result in re-routing the Proposed Project; however, over the past 10 years an underground PG&E transmission alignment has not had to be altered by more than a few feet due to such an obstacle so significant re-routing is not anticipated (PG&E, 2013).

Additional utilities identification and invert profile of existing lines would occur during final project design. As discussed in Item (c), by implementing APM UTIL-1, PG&E would coordinate with SFPUC regarding its stormwater system facilities, including its storage/transport box located under The Embarcadero where the proposed transmission line would cross. Section 4.11.5 discusses the steps that PG&E would take to coordinate with other utility system owners and implement measures such as increased cathodic protection or utility relocation to minimize any potential effects to existing facilities. If it is determined during detailed design that the proposed 230 kV transmission line duct bank must be installed in a configuration that conflicts with an existing gas line listed Table 5.17-3, the PG&E Embarcadero-Potrero Transmission Project Team would work with the PG&E Gas Engineering and Construction Department to safely relocate the affected gas line (PG&E, 2013).

Additionally, under Section 1, Chapter 3.1, "Protection of Underground Infrastructure," Article 2 of California Government Code §§4216-4216.9, PG&E is required to contact a regional notification center at least two days prior to excavation of any subsurface installation. This action would cause Underground Service Alert to notify the utilities that may have buried lines within 1,000 feet of the project. Representatives of the utilities are required to mark the specific location of their facilities within the work area prior to the start of project activities in the area. The location of all underground electric, water, gas, cable or telecommunications lines within the vicinity (at least 1,000 feet) of the Proposed Project would be marked. In addition, PG&E would probe and expose existing utilities by hand before using power equipment to prevent impacts to existing utilities (PG&E, 2012).

Accidental Disruption and Coordination with Existing Underground Utility Owners. Coordination with other utility system owners and compliance with California Government Code §§4216-4216.9, CPUC General Order 128, and APM UTIL-1 would reduce the likelihood of accidental disruptions. However, APM UTIL-1 only states that the HDD depth would be coordinated with SFPUC to prevent damaging its stormwater storage box. Accidental disruptions could still occur to this and other facilities, especially during the underground segments on land. This impact is considered potentially significant even with regulatory compliance and implementation of APM UTIL-1, but would be mitigated to less than significant levels with the implementation of Mitigation Measure UT-1 (Protect underground utilities), which would ensure that existing facilities, in addition to the SFPUC's stormwater storage box identified in APM UTIL-1, are identified and avoided, and proper coordination with other utilities occurs.

Prior to construction, PG&E would provide construction notification to minimize construction disturbance under APM LU-1 and would 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 (PG&E, 2012).

In addition, if the proposed 230 kV transmission duct bank crosses within 5 feet of a steel gas line, induced electrical currents travelling from and in the immediate vicinity of electric transmission line are known to accelerate the corrosion of nearby existing steel pipelines, which could lead to long term accidental system disruption of such pipelines. If the transmission line is placed more than 5 feet away or if protective measures are instituted, such as cathodic protection (a specialized rubber coating applied to the affected steel pipe), issues with induced current and collocation with existing underground gas transmission lines would be avoided.

As described in Section 4.11.5 of the Project Description, PG&E would identify utilities during final design, evaluate their proximity and potential for induced current and/or corrosion, and in coordination with the utility-system owner, determine whether steps are necessary to reduce the potential to induce current or cause corrosion. PG&E would take the necessary steps in coordination with those utility system owners to minimize any potential effects through measures, such as increased cathodic protection or utility relocation. The steps are summarized as follows:

- During final design, prepare study of corrosion and induced currents.
- Send results of study to each affected utility system owner for review and comments.
- Owners submit requirements for protection of each of their facilities.
- PG&E makes changes accordingly or compensates owner for future protection measures, per the owner's preference.

These steps, in addition to documentation of consultation required in Mitigation Measure UT-1, would ensure that existing underground steel pipelines are protected, as necessary, to reduce the risk of corrosion and resulting long-term accidental system disruption to a less than significant level.

Mitigation Measure for Accidental Utility Service Disruptions

MM UT-1 **Protect underground utilities.** Prior to commencing construction of the underground transmission line, PG&E shall submit to the CPUC written documentation of the following:

- Construction plans designed to protect existing utilities, showing the dimensions and location of the finalized alignment as well as the corrosion and induced currents study;
- Records that the Applicant provided the plans to the City and County of San Francisco for review, revision and final approval;
- Construction plans approved by the City and County of San Francisco detailing the steps taken to prevent damage to two large SFPUC storm sewers, including but not limited to an appropriate shoring plan, work zone restrictions, and setbacks for the adjacent structures, at the following locations: (1) in the intersection of Spear and Folsom; and (2) at the end of the route as it turns to enter Embarcadero Substation;
- Evidence of coordination with all utility owners within the approved right-of-way, including their review of construction plans, results of the induced current and corrosion potential analysis, and a description of any protection measures or compensation to be implemented to protect affected facilities;
- Copy of the Applicant's database of emergency contacts for utilities that may be in close proximity or require monitoring during construction of the project;
- Evidence that the project meets all applicable local requirements;
- Evidence of compliance with design standards; and
- Copies of any necessary permits, agreements, or conditions of approval.

Planned Utility Service Disruption During Construction. Also during final design, PG&E would assess whether some service disruptions during construction may be potentially unavoidable. These disruptions may occur while the transmission line and vaults are installed in the trench and the interrupted utility is reconnected around the new transmission line. If planned service disruptions are necessary, then PG&E has stated that it would closely coordinate with affected utilities until those utilities are returned to service. The affected utility may notify its customers regarding the outage in accordance with its company procedures and regulations.

For any planned outages to PG&E's own system, under CPUC Electric Rule No. 14 (Shortage of Supply and Interruption of Delivery), PG&E would provide reasonable notice to its affected customers and work would proceed as rapidly as may be practicable and at a time that will cause the least inconvenience to the majority of those involved. Under CPUC Electric Rule No. 14, PG&E would also be responsible for answering all outage related inquiries. Through coordination with affected utilities and efforts to minimize outage durations and provide advanced notification of any electric outages, impacts related to planned outages would be less than significant.

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5.18 Corona and Induced Current Effects

5.18.1 Environmental Setting

Corona

The corona effect is the physical manifestation of discharged electrical energy into very small amounts of sound, radio noise, heat, and chemical reactions with air components. It is a phenomenon associated with the electrical gradient at the surface of all energized electrical materials but is especially common with high-voltage power lines.

The amount of corona produced by a power line is a function of several factors including; line voltage, conductor diameter, conductor locations in relation to each other, power line elevation above sea level, condition of conductors and hardware, and local weather conditions. Corona is less noticeable for lines that are operated at lower voltages (i.e., subtransmission and distribution lines). The electric field gradient is greatest at the conductor surface. Larger-diameter conductors have lower electric field gradients at the conductor surface and, therefore, lower corona noise than smaller-diameter conductors. Corona typically becomes a design concern for power lines that are overhead at voltages of 230 kV and higher (i.e., transmission lines). The corona effect would not be a design concern for underground and submarine portions of power lines, regardless of voltage level, since the energized conductors are fully enclosed in a semi-conducting layer within the insulated cables that serve to equalize the electrical gradient at the surface of the components.

Induced Currents

Electric currents can be induced in metallic objects located within the electric fields created by power lines. An electric current can flow when an object has an induced charge and a path to ground is presented. The amount of induced current that can flow is important to evaluate from a safety perspective because of the potential for electrical shocks to people and the possibility of electric arcs that could form across small gaps between conductive surfaces. These arcs can have secondary effects such as ignition of flammable materials in the vicinity of the arc. In addition induced currents are evaluated for their potential to lead to corrosion of metallic objects from the discharge of the induced current to ground.

From a safety perspective the National Electrical Safety Code (NESC) specifies that transmission lines be designed to limit short circuit current from vehicles or large objects near the line to no more than 5 milliamps (mA). CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communication Systems, specifies the construction materials, clearances and depths for the proposed transmission line, and CPUC General Order 95, Rules for Overhead Electric Line Construction Section 35, covers all aspects of design, construction, operation, and maintenance of overhead electrical power lines and fire safety hazards. The Public Utilities Code, the CPUC General Orders and the NESC also address shock hazards to the public by providing guidelines on minimum clearances to be maintained for practical safeguarding of persons during the installation, operation, or maintenance of transmission lines and their associated equipment.

5.18.2 Environmental Impacts and Assessment

The CEQA Guidelines do not provide significance criteria for evaluating significant impacts from corona or induced current effects. Corona and induced current from high-voltage power lines can cause environmental impacts through:

- Audible noise
- Radio and television interference
- Computer interference
- Disturbance of cardiac pacemakers
- Ignition of flammable materials
- Corrosion of buried metallic objects

The project would include a new, single-circuit 230 kV transmission line of approximately 3.5 miles in total length, including approximately 2.5 miles in the San Francisco Bay and the remainder underground in paved city streets. The line would include an overhead transition of new 115 kV cables to interconnect the new Potrero 230 kV Switchyard and the existing 115 kV Potrero Switchyard; corona effects associated with the overhead transition could create audible noise impacts. 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. The audible corona noise level caused by the new 115 kV components at the Potrero Switchyard was not quantified. However, circuits operating at 115 kV typically cause noise at levels comparable to the ambient baseline noise levels, which as noted in Section 5.12 (Noise), would include the existing equipment at the Potrero Switchyard. The corona noise impacts would thus be less than significant.

Although corona can generate high frequency energy that may interfere with broadcast signals or electronic equipment, this is generally not a problem for transmission lines. The Institute of Electrical and Electronic Engineers (IEEE) has published a design guide (IEEE, 1971) that is used to limit conductor surface gradients so as to avoid corona levels which would cause electronic interference. Corona or gap discharges related to high frequency radio and television interference impacts are dependent upon several factors, including the strength of broadcast signals, and are anticipated to be very localized if they occur. Individual sources of adverse radio/television interference impacts can be located and corrected on the power lines. Conversely, magnetic field interference with electronic equipment such as computer monitors can be corrected through the use of software, shielding or changes at the monitor location. As a result, impacts from corona, radio/television interference, and magnetic fields would be less than significant.

Induced currents and voltages on conducting objects near the proposed transmission line would not pose a threat in the environment if the conducting objects are properly grounded. Project construction and operation would meet or exceed CPUC General Order 95 and General Order 128 standards and work would be done in accordance with PG&E's Code of Safe Practices. PG&E would identify other underground utilities during final design, evaluate their proximity and their potential for induced current and/or corrosion. PG&E would coordinate with the utility-system owner to determine whether steps are necessary to reduce the potential to induce current or cause corrosion (p.2-37 of PG&E, 2012a). Grounding would be incorporated into PG&E's design plans, and as a result, impacts would be less than significant. Likewise, induced currents would not significantly increase the risk of fuel ignition in the area.

The electric fields associated with the Proposed Project's transmission line may be of sufficient magnitude to impact operation of a few older model pacemakers resulting in them reverting to an asynchronous pacing (IEEE, 1979). Substantial adverse effects would not occur with prolonged asynchronous pacing; periods of operation in this mode are commonly induced by cardiologists to check pacemaker performance. However, the transmission line's electric field would be shielded along the entire proposed route by being placed underground, which would eliminate any above ground electric field so that it would not impact operation of older model pacemakers. No mitigation measures would be required or recommended.

5.19 Mandatory Findings of Significance

This section discusses mandatory findings of significance as well as potential cumulative and growth-inducing impacts. CEQA Guidelines §15065 requires that the lead agency make findings on whether the Proposed Project would individually or cumulatively have a significant effect on the environment.

MANDATORY FINDINGS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? (*Cumulatively considerable* means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐
c. Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Significance criteria established by CEQA Guidelines, Appendix G.

5.19.1 Cumulative Projects

Under the CEQA Guidelines, a project "has possible environmental effects that are individually limited but cumulatively considerable. Cumulatively considerable means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." 14 Cal Code Regs §15065(a)(3). CEQA Pub. Res. Code §21000 et seq., an EIR must discuss cumulative impacts if the incremental effect of a project, combined with the effects of other projects is "cumulatively considerable." 14 Cal Code Regs §15130(a). Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." 14 Cal Code Regs §15164(b)(1). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis.

There are two commonly used approaches, or methodologies, for establishing the cumulative impact setting or scenario. One approach is to use a "list of past, present, and probable future projects producing related or cumulative impacts." 14 Cal Code Regs §15130(b)(1)(A). The other is to use a "summary of projects contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact." 14 Cal Code Regs §15130(b)(1)(B). This IS/MND uses the list approach to provide a tangible understanding and context for analyzing the potential cumulative effects of the project.

The San Francisco Planning Department anticipates total development in the Transit Center area of between 2005 and 2030 of approximately 6,100 new households (about 9,470 residents) and about 7 million square feet of commercial space, 90 percent of which would be office space, with most of the remainder being hotel space and about 100,000 square feet of retail space (SF Planning Department, 2011). A list of cumulative projects used for this analysis is provided in Table 5.19-1 and Figure 5.19-1 shows the general location of the cumulative projects. Not every project currently proposed or under development in this area was included in the list due to the large amount of development underway. The list includes most major projects within a 0.5-mile radius of the Proposed Project. Large construction projects within a 0.5-mile radius would be expected to affect similar types of resources as the Proposed Project and potentially result in cumulative impacts. The projects were reviewed to identify whether the Proposed Project would result in a cumulatively considerable contribution to a significant cumulative impact when evaluated in combination with other related projects. While not every project proposed in this area is included in Table 5.19-1, the overall growth and development in the area was considered in the analysis as well as the individual projects to conservatively analyze any impacts of smaller projects not listed in Table 5.19-1.

Table 5.19-1. Cumulative Projects in the Project Vicinity

Project Name	Description/Location	Status	Proximity to Project Route (miles)
34th America's Cup	Permanent improvements to Pier 30/32	Ongoing	Adjacent
Golden State Warrior Pier 30/32 Project	Permanent improvements to Pier 30/32 consisting of a 740,000-square-foot and 135-foot-high venue with a seating capacity for 17,500 people. Includes parking and open space. New maritime uses including a ferry landing, fire boat/fire station facility accommodating three fire boats, water taxi landing, and kayak docking.	EIR expected June 2013; project to be completed by 2017-2018 basketball season.	Adjacent
Pier 36/Brannan Street Wharf	Demolish Pier 36 and build new 57,000 square foot recreational pier structure south of Pier 30/32	Completion expected June 2013	0.14
Transbay Transit Center	Construction of a new Transbay Terminal transit hub at First and Mission streets and extending Caltrain and California High Speed Rail underground from Caltrain's current terminus at 4th and King streets.	Under construction	0.25
Transit Center District Plan and Transit Tower	Market, Stuart, Folsom, & mid-block between Third and New Montgomery / 1,070 foot office tower	Approved, construction of Block 9 expected in early 2014.	Adjacent
Transbay Redevelopment Area, Block 6/7, Request for Proposal, north of Folsom Street	Folsom between Fremont & Beale / High-density residential project	In planning	Adjacent
SF MOMA Expansion & Fire Station Relocation	Third between Mission and Howard, and 935 Folsom between Fifth & Sixth / relocate fire station to new building with residential units	Construction expected between summer of 2013 and early 2016.	0.41
706 Mission Street – Mexican Museum & Residential Tower	NW corner of Third & Mission / 47-story tower	Under environmental review, Draft EIR published June 2012	0.47

Table 5.19-1. Cumulative Projects in the Project Vicinity

Project Name	Description/Location	Status	Proximity to Project Route (miles)
Academy of Art University Project	460,000 square feet institutional, 110,000 residential, 100,000 indoor recreational space expansion in the following Study Area blocks: (1) Study Area-8 – Mission, Fourth, Folsom, Fifth (2) Study Area-9 – Harrison, Second, Bryant, Third (3) Study Area-10 – Folsom, Main, Bryant, Beale (4) Study Area-11 – Brannan, First, Bluxome, Third (5) Study Area-15 – North of 16th: bounded by Fourth, waterfront, & China Basin St.; South of 16th: bounded by Illinois, 23rd & Pennsylvania	AAU is preparing an EIR	Varies between adjacent to 0.55
Pier 70 Master Plan (Port of San Francisco)	Master planning effort for a 69-acre site located in the City's Central Waterfront (between Mariposa and 22nd Streets) which is proposed to rehabilitate historic resources, provide new shoreline open space, allow infill development, and conduct environmental remediation where required. Generally east of Illinois Street between Mariposa and 22nd Streets.	Scheduled office work planned for completion before 2014. Additional development likely after PG&E project completion.	0.12
2290-2298 Third Street, Residential Retail Project10	Corner of 3rd and 20th, adjacent to Dogpatch neighborhood	Approved	0.41
Southern Waterfront Gateway Sites (Port of San Francisco)	The Port has identified three Gateway Sites to promote economic development of the Southern Waterfront: Cargo Terminal Gateway, Third & Cargo Gateway, and Islais Creek Gateway.	In planning	0.53
Pier 40 – Phase II Rehabilitation (San Francisco Redevelopment Agency)	Rehabilitation work consisting of refurbishment of the historic Pier 40 shed, improved public access, and upgrades to the Pier 40 substructure.	In planning	0.37
Pier 24 Annex Rehabilitation (Port of San Francisco)	Rehabilitation of the Pier 24 Annex Building located along the Embarcadero at Harrison Street for use as a multi-use retail facility.	Existing (2009)	0.10
Pier 22½ Fireboat Station Rehabilitation and Alteration (Port of San Francisco)	Rehabilitation and alteration of Fire Station 35 at pier 22½.	Existing (2011)	0.10
Downtown Ferry Terminal Project (Port of San Francisco)	Plans for the Phase II development of the Downtown Ferry Terminal are currently being studied by the Water Emergency Transportation Authority (WETA).	In planning	0.34
Maintenance Dredging (Port of San Francisco)	Maintenance dredging of sediments from Fisherman's Wharf, Hyde Street Harbor, Pier 9, Berth 27, Berths 35 East and West, Pier 40, Berths 80A through D, Islais Creek and Approach, Berths 92 East and West, Berth 94, Berth 96, Downtown Ferry Terminal and other similar sites at the Port of San Francisco waterfront.	Ongoing at different piers through 2015.	0.12
Ferry Building Area, Seawall Lot 351	Development of the existing 27,937-square-foot parking lot for restaurant/retail and parking uses in conjunction with 8 Washington Street.	Under environmental review, FEIS published 2/13	0.34

Table 5.19-1. Cumulative Projects in the Project Vicinity

Project Name	Description/Location	Status	Proximity to Project Route (miles)
Blue Greenway Trail Project (Port of San Francisco)	Improvements to San Francisco's southern portion of the Bay Trail and the Bay Water Trail, which may include installation of tables, benches, lights, bollards, and bike racks. The Blue Greenway will follow Illinois Street	In planning	Adjacent
Agriculture Building located on The Embarcadero at Mission Street	Rehabilitation and seismic upgrades to the existing Agriculture Building, which may include the following uses: support for expanded ferry services, restaurant, retail, and office.	In planning	0.24
San Francisco Bicycle Plan	Includes near-term bicycle route improvement projects, long-term bicycle route network improvement projects, and minor improvements such as signage and pavement marking changes.	Ongoing	Adjacent
Embarcadero Hotel (Port of San Francisco)	Potential for 245 hotel rooms, current lease to Teatro Zinzanni, Seawall Lot 324 between Broadway and Vallejo Street.	In planning	0.16
Piers 48 – 50, Seawall Lot 337 Mixed Use Project (Port of San Francisco)	875 residential units; 500 hotel rooms; 181,000 square feet of institutional uses; 1,700,000 square feet of office uses; and 281,000 square feet of commercial uses.	In planning	0.43
Central Subway	Extend Muni's T-Third light rail line from the intersection of Fourth/King into Union Square and Chinatown. Utility relocation prior to tunnel boring is under way, and construction is scheduled to be completed by 2018.	Under construction, construction planned until 2018.	0.48
Embarcadero 230 kV Bus Upgrade	Reliability project involving replacement of 230 kV substation equipment at the PG&E Embarcadero Substation. Although this project will share facilities with the Proposed Project if both are built, construction will proceed independently.	Construction is tentatively scheduled to start in 2014 and end in 2016	Adjacent
Moraga-Potrero 230 kV Transmission Line	Electrical transmission line proposed to be built by PG&E between the Moraga Substation and Potrero Switchyard.	In preliminary planning stages	Adjacent
Trans Bay Cable Black Start Project	Trans Bay Cable, LLC operates the TBC direct current (DC) line connecting Pittsburg to Potrero, with a converter station located across 23rd Street to the south from Potrero Switchyard. TBC is considering proposed solutions, known as the Black Start project, to provide dead bus energization and load restoration to San Francisco in the event of loss of service to their converter station through the 115 kV system. This project would add two 1.5 MW generators to provide redundant, fast ramping energy for rapid response to supply power to the TBC and energy to the TBC HVDC system's Potrero 115 kV bus.	CAISO Board Approved March 20, 2013	Adjacent
Potrero 115 kV Bus Upgrade Project	An upgrade the Potrero 115 kV bus by removing the tie-lines to the former Potrero Power Plant, moving the location of two elements, and adding two sectionalizing breakers.	CAISO Board Approved March 20, 2013	Adjacent

Table 5.19-1. Cumulative Projects in the Project Vicinity

Project Name	Description/Location	Status	Proximity to Project Route (miles)
75 Howard St. Project	Proposes to demolish the existing 8-story parking garage (containing 550 parking spaces). The project would construct a residential bldg. containing 175 residential units and a below-grade parking garage. The parking garage would contain accessory parking spaces for the residential units as well as approx. 100 non-accessory parking spaces to serve retail uses in the surrounding area that currently rely upon the 550 spaces within the existing garage	Under environmental review	0.2
201 Folsom	Entitled for up to 725 units, development with two towers, 350 feet and 400 feet in height, and two mid-rise podium buildings.	Under construction	0.1
325 Fremont	200-foot, 22-story building with 70 residential units	In planning	0.1
333 Fremont	8-story residential building entitled for 83 condominiums and 3 levels of underground parking.	Under construction	0.1
399 Fremont	New residential project with approximately 450 dwelling units and 240 parking spaces.	Building permits approved	0.1

Source: PG&E, 2012; SF Planning Department, 2013; SF Planning Department, 2011.

5.19.2 Cumulative Impact Assessment

The intent of the Proposed Project is to improve reliability of PG&E's transmission system for existing users, not to expand service or facilities, and long-term operational effects would be minor. Implementation of APMs and mitigation measures would minimize the short-term construction-related impacts related to aesthetics, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, transportation/traffic, and utilities and service systems. A discussion regarding each resource area is provided below.

Aesthetics

As described in Section 5.1, the viewshed of the Proposed Project is an urban setting and electric distribution and infrastructure are elements of the existing landscape. The setting has a history of development and continued urbanization is the likely trend for the foreseeable future with little change in its overall visual character. The impacts from the construction of the transmission line would be minimal because the work would be temporary in nature. Construction and operation of the transmission line would not require lighting. New lighting would be added to the Potrero Substation, but impacts would be less than significant with implementation of APM AE-1, that would require use of non-glare or hooded fixtures and directional lighting to reduce spillover into areas outside the substation site and minimize the visibility of lighting from off-site locations.

Other projects in the region are contributing to increased development and urbanization, including potentially increased lighting; however, the Proposed Project would not contribute any visual change associated with such land use changes in this area. The project would be underground for the onshore portion of the transmission line and under the bay for the offshore portion and would have no contribution to a cumulative aesthetic impact.

The new Potrero 230 kV Switchyard in conjunction with past and foreseeable projects such as the Trans Bay Cable Black Start Project would minimally contribute to the industrialization of the Dogpatch neighborhood. However, given the existing industrial nature of the location and the distance from sensitive viewers, the overall industrial development would not result in a cumulatively significant impact. Projects such as the Moraga-Potrero 230 kV line and the Trans Bay Cable Black Start Project could potentially contribute to visual impacts near the proposed Potrero Switchyard, but like the Proposed Project, would undergo CEQA review and would incorporate mitigation to reduce impacts such that it would not be out of character with the surrounding landscape and existing industrial facilities.

Agriculture and Forestry Resources

As discussed in Section 5.2, no agricultural or forestry lands exist within the project area and neither the Proposed Project nor any of the cumulative project would convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. The project would not conflict with existing agriculture zoning or a Williamson Act contract. It would not conflict with existing zoning for or cause rezoning of forest land, nor would it result in the loss of forest land or conversion of forest land to non-forest use. Therefore, the project would not contribute to potential cumulative impacts that may result in the loss of agriculture or forestry resources.

Air Quality

As discussed in Section 5.3, Table 5.3-2 (Attainment Status for BAAQMD), the region is currently designated as “nonattainment” for ozone, PM10, and PM2.5. Concurrent construction of other projects in close proximity to the Proposed Project would result in increased local air quality impacts for the duration of simultaneous construction activities, a significant cumulative impact. However, the maximum daily emissions generated by the project would be temporary in nature and would only occur during a small fraction of project construction. Simultaneous construction of City projects and other cumulative projects in close proximity to the project work sites would generally be subject to the San Francisco Dust Control Ordinance and would be likely to implement general BAAQMD recommendations for minimizing air quality impacts. All activities must comply with BAAQMD rules regarding dust control. Table 5.3-5 in Section 5.3 shows that construction-related criteria air pollutants would not exceed thresholds that indicate cumulatively considerable levels. Therefore, with the implementation of APMs AQ-1 through AQ-3 and Mitigation Measure A-1 (Achieve minimum emission standards), the Proposed Project would reduce its contribution to the impact to less than cumulatively considerable.

The Proposed Project would generate diesel particulate matter (DPM) and residences and other sensitive receptors near the anticipated work areas would be temporarily exposed to increased concentrations of DPM and other toxic air pollutants from the construction-related mobile sources. Simultaneous construction of City projects and other cumulative projects in close proximity to the project work sites would also potentially expose sensitive receptors to construction-related emissions. If multiple foreseeable projects identified in Table 5.19-1 were under construction at the same time, they would all generate DPM and potentially result in a significant cumulative impact. The Proposed Project’s underground transmission line work would occur over approximately 8 months, but construction at any one work site would last a much shorter time, and construction-related emissions would be sporadic as the different phases of construction would pass near receptors during the short-term. With the recommended APMs and mitigation, the project would achieve minimum performance standards for control of diesel exhaust, which would ensure that receptors would not be exposed to substantial concentrations of DPM or other toxic air contaminants. Other cumulative projects in close proximity to the project work sites would

Source: PG&E, 2012, and SF Planning Department, 2013 .

Figure 5.19-1
Cumulative Projects

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generally be subject to the San Francisco Dust Control Ordinance and would be likely to implement general BAAQMD recommendations for minimizing air quality impacts. With implementation of Mitigation Measure A-1, the Proposed Project's contribution to cumulative exposure of sensitive receptors to substantial pollutant concentrations would not be cumulatively considerable.

Biological Resources

As discussed in Section 5.4, potential impacts to biological resources would occur from construction of the Proposed Project, including adverse impacts to candidate, sensitive, or special-status wildlife species and impacts to migratory or nesting birds. Impacts from the Proposed Project would be less than significant with the implementation of APMs and mitigation measures discussed in Section 5.4. Construction of other projects in the area during the same construction timeframe may contribute to cumulative impacts through temporary effects to biological resources in the project area, mainly through work in and around the San Francisco Bay. Projects with the potential to affect resources within the bay include the Brannan Street Wharf project, the Golden Gate Warriors Pier, the Pier 70 Redevelopment Project, other pier projects and the America's cup, as well as dredging, a potentially cumulative significant impact. However, the Proposed Project's contribution to cumulative impacts would be reduced through implementation of APMs and mitigation measures to less than cumulatively considerable.

Construction disturbance during the breeding season could affect breeding birds. Multiple projects listed in Table 5.19-1 would have multi-year construction timeframes including residential development projects, the Central Subway, and the Transbay Transit Center, and could also result in disturbance to breeding birds near to the Proposed Project, a potentially significant cumulative impact. The Proposed Project's contribution to cumulative effects to nesting birds would be reduced to a less than significant contribution with implementation of Mitigation Measure B-4 that would require preconstruction surveys and appropriate protective measures.

Construction noise and vibration could disturb protected mammals including marine mammals. Multiple projects listed in Table 5.19-1 would have multi-year construction timeframes and could also result in noise and vibration both onshore (such as with the residential and commercial development) and offshore (such as with the Brannan Street Wharf project, the Golden Gate Warriors Pier, or other projects location in or adjacent to The Embarcadero). Construction of multiple on- and offshore projects at the same time would result in a potentially significant cumulative impact. The National Marine Fisheries Service has concluded in the Incidental Harassment Authorizations it has prepared for hydro-acoustic effects that boat traffic related to the America's Cup and other projects will have no or minimal effect on marine mammals and fish species, and therefore the vessel traffic in this area would not have an effect that could contribute to a potential cumulative impact (PG&E, 2012). The Proposed Project's contribution to cumulative effects to marine life mammals would be reduced to a less than significant contribution with implementation of APMs BIO-1 and BIO-5 and Mitigation Measures B-1, B-2, and B-3 that specify protections for reducing potential impacts to marine life and marine mammals.

Impacts to biological resources of the Embarcadero Substation and Potrero Switchyard during operation and maintenance would be the same as those during current operation and maintenance practices; there would be some additional disturbance of the Central Bay for periodic maintenance and repair of buried cable but this would be on a small scale. Additional periodic disturbance of the Central Bay could eventually occur with the potential development of the Moraga-Potrero 230 kV transmission line but as with the Proposed Project, such disturbances would be infrequent or periodic, and on a small scale. Therefore, impacts would not be cumulatively considerable.

The Proposed Project would have no impact to riparian habitat or other sensitive natural community, would not affect federally protected wetlands, nor conflict with the provisions of an adopted Habitat Conservation Plan or other approved habitat conservation plan so would not contribute to the cumulative impact on these resources.

Cultural Resources

As noted in Section 5.5, the Proposed Project would result in less than significant effects to the historical resource Station A. Station A is located adjacent to the southern terminus of the Proposed Project, at the Potrero Switchyard, and could be impacted by other approved projects including the Trans Bay Cable Black Start Project and the Potrero 115 kV Bus Upgrade Project, a potentially significant cumulative impact to the historical resource. Implementation of APMs CUL-7 and CUL-8 will document and record the setting of Station A and its few remaining elements which would reduce the cumulative contribution of the Proposed Project to less than significant.

No known archaeological sites are present along the Proposed Project route but areas of low, moderate, and high sensitivity for prehistoric and historical resources have been identified. Potential impacts to prehistoric and historical resources could combine with impacts from the projects presented in Table 5.19-1 which are located along this same route to result in potentially significant cumulative effects. Implementation of APMs CUL-1 through CUL-5 and Mitigation Measures C-1 and C-2 would reduce the contribution to cumulative effects to less than significant.

The Proposed Project impacts to paleontological resources would be less than significant because of the moderate- to low-sensitivity of the underlying formations. Because the Proposed Project would only affect paleontological resources along the project route itself, it would not contribute to cumulative impacts to scientifically important paleontological resources. The Proposed Project is not anticipated to have any impact to human remains so would not contribute to cumulative impacts to such resources.

Geology and Soils

As discussed in Section 5.6, the Proposed Project would be located in an area mapped as likely to experience strong ground shaking, including ground shaking that could result in liquefaction-related phenomena and erosion. Projects located in Table 5.19-1 would also be located in areas mapped as likely to experience strong ground shaking potentially combining to expose people or structures to potential significant cumulative impacts. The Proposed Project would be designed as required by the Institute of Electrical and Electronic Engineers guidelines in the IEEE 693 (Recommended Practices for Seismic Design of Substations), and the 230 kV transmission line and associated structures would be designed as required by CPUC General Order 128 (Rules for Construction of Underground Electric Supply and Communication Systems). Additionally, the Proposed Project would implement APM GS-1 (Appropriate soil stability design measures implementation) and APM GS-2 (Appropriate seismic safety design measures implementation) which would reduce the project’s contribution to a cumulative impact to less than significant.

Greenhouse Gas Emissions

As discussed in Section 5.7, construction of the Proposed Project would result in emissions of GHGs from on-site construction equipment, marine vessel trips, and off-site motor vehicle trips. The most common GHGs associated with fuel combustion are CO_2, CH_4, and N_2O. Impacts from the Proposed Project would be less than significant because GHG emissions for the project would be well below existing numerical significance thresholds. The small quantity of GHG emissions from construction would occur over a limited term and not be cumulatively considerable.

Operation of the project would be incorporated into existing PG&E activities so GHG emissions from operation and maintenance activities would not notably increase as a result of this project. Small quantities of SF_6 emissions could potentially contribute to cumulative GHG impacts. Operational emissions would be reduced to a level that is less than significant with implementation of APM GHG-2 and would not be a significant contribution to a cumulative impact.

Hazards and Hazardous Materials

As discussed in Section 5.8, the project would create a less than significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials and upset and accident conditions involving the release of hazardous materials. The Proposed Project would also handle hazardous materials within 0.25 miles of three day care centers. Projects listed in Table 5.19-1 would use similar hazardous materials associated with construction such as cleaning solvents, paints, adhesives, vehicle fuels, oil, and other. In order for a cumulative effect to occur, multiple projects would need to release hazardous materials at the same time in close proximity to each other which is unlikely because each project is required to implement safety measures to reduce the risk of hazardous materials release. There would be no cumulatively significant impact.

The southern segment of the Proposed Project would be located on and adjacent to several sites that are or have been listed as hazardous material sites. Proposed Project construction would result in exposure of construction workers to potential health hazards. Such exposure would be hazardous to people in the immediate vicinity of the contamination since the contaminant would either be limited to the medium in which it is discovered or would volatilize and become airborne. If fumes from potential contamination volatilized, risk of exposure would decrease as distance from the source of contamination increased due to dispersal of the fumes. While concurrent construction at projects located immediately adjacent to the Proposed Project would be subject to the same risk of encountering unknown contaminants and exposing workers to health hazards, such exposure is not likely to combine with effects of the Proposed Project to result in a significant impact because of the extremely localized nature of exposure to such contaminants. The contribution of the Proposed Project to a cumulative significant hazard would be less than significant.

The Proposed Project would not be located within an airport land use plan, vicinity of a private airstrip, impair the implementation of an adopted emergency response plan, or expose people or structures to a significant risk involving wildland fires so would not contribute to a cumulative effect.

Hydrology and Water Quality

As noted in Section 5.9, the Proposed Project could impact water quality due to leaks, spills, or releases of hazardous or potentially hazardous materials and due to the encountering of existing contamination in the project area. Similar impacts could result from the construction of the projects listed in Table 5.19-1, especially the projects that occur near or in the San Francisco Bay such as the projects along The Embarcadero or the maintenance dredging. As with the Proposed Project, each of the foreseeable construction projects would implement regulatory requirements to ensure implementation of a Stormwater Pollution Prevention Plan and BMPs to avoid adverse water quality effects. The construction of the past, present, and cumulative projects would not result in a significant cumulative impact to water quality as a result of releases of hazardous materials.

The Proposed Project could affect groundwater supplies through direct consumption of groundwater resources; indirect depletion of groundwater supplies such as conducting dewatering activities where the water is not returned to the subsurface; and/or introduce substantial new impervious areas or increased soil compaction such that the rate of infiltration of stormwater runoff to the subsurface is substantially affected. Construction projects presented in Table 5.19-1 would result in similar impacts to groundwater supplies, especially through direct consumption of groundwater resources during construction. Water supply requirements associated with the Proposed Project would be short-term and temporary, limited to the project's construction period. Recharge into the Downtown San Francisco Groundwater Basin would occur regardless of project-related dewatering activities As such, the Proposed Project would not substantially deplete groundwater supplies as a result of water supply requirements and the contribution to cumulative groundwater depletion would be minimal.

The Proposed Project would not substantially alter existing drainage pattern of a site through substation erosion or siltation or through an increase in the rate or amount of surface runoff. No vegetation removal would occur due to the project, and the project would not introduce substantial new areas of impervious surfaces. Similarly, the projects listed in Table 5.19-1 are primarily infill which would occur on impervious surfaces or may increase the pervious surfaces in San Francisco such as with the Pier 70 Master Plan which includes new open space. The impact of the Proposed Project to drainage patterns would not be cumulatively considerable.

Portions of the proposed facilities, including the Potrero Switchyard, are located within a Tsunami Hazard Area identified by the California Emergency Management Agency. The projects in Table 5.19-1 that are located along the piers or The Embarcadero would also be within the Tsunami Hazard Area. The Proposed Project is subject to inundation by tsunami but would not alter existing potential for inundation by tsunami and would introduce facilities that are consistent with infrastructure and facilities in the project area. The project would not result in a cumulatively significant impact.

The Proposed Project would not create or contribute runoff water that would exceed existing or planning stormwater drainage systems, substantially degrade water quality, place housing within a 100-year flood hazard area, or expose people or structures to a significant risk of loss, injury or death involving flooding. Therefore the Proposed Project would not contribute to a cumulative impact to these criteria.

Land Use

As discussed in Section 5.10, the Proposed Project would not physically divide an established community or conflict with applicable habitat conservation plans or natural community conservation plans. The Proposed Project would not conflict with applicable land use plans, policies, or regulations and construction impacts to land use would be of short duration. The project is compatible with applicable land use policies and regulations, and PG&E would provide access to residences and businesses during construction, provide advance notification of construction activities, and provide a public liaison person before and during construction. Therefore, the project's contribution to potential cumulative impacts to land use would be less than cumulatively considerable.

Mineral Resources

As discussed in Section 5.11, no commercial mineral resources are known to exist within the project area and the Proposed Project would not result in the loss of availability of a known mineral resource; therefore, the project would not contribute to potential cumulative impacts that may result in the loss of mineral resources.

Noise

As discussed in Section 5.12, the Proposed Project would expose persons to noise levels in excess of standards for the underground transmission line construction, horizontal directional drilling, submarine cable installation, and operation and maintenance of the line. For each of these construction elements there are multiple cumulative projects that could combine to result in a cumulative impact due to construction noise. However, the maximum noise levels of the Proposed Project construction activities would be mitigated to levels compliant with the San Francisco Police Code and would be further reduced through APMs NO-1 through NO-7. As such, with Mitigation Measures N-1 and N-2, the contribution of the Proposed Project to the cumulative exposure to noise levels in excess of standards would be less than significant.

The Proposed Project would result in temporary less than significant levels of groundborne vibration at the closest sensitive receptors to the Proposed Project, see Table 5.12-5. Potentially annoying vibration levels would be avoided where possible and limited in duration. The contribution of the Proposed Project to cumulative effects caused by groundborne vibration would be less than significant.

The Proposed Project would result in little to no permanent increase in ambient noise levels above existing conditions because noise would be limited to transformer and shunt reactor operations at the Potrero Switchyard and periodic maintenance along the route. Operation and maintenance would have only minimal contribution to a cumulative increase in ambient noise levels.

The Proposed Project would not be located within an airport land use plan or in the vicinity of a private airstrip so would not expose people residing of working in the project area to excessive noise levels.

Population and Housing

As discussed in Section 5.13, the Proposed Project would not result in impacts to population and housing. Approximately 20 percent of the workforce would be locally sourced, and adequate hotel and motel accommodations and rental housing within San Francisco would be available to accommodate the 65 workers that would potentially relocate temporarily to the area. The project would not displace any existing housing or people. The Proposed Project would not contribute to significant cumulative impacts because it would have no impacts on population and housing.

Public Services

As discussed in Section 5.14, the Proposed Project would not result in significant impacts to public services. The Proposed Project would not require the cessation or interruption of fire or police protection services, schools, or other public facilities. Construction and maintenance activities would be performed in accordance with the San Francisco Municipal Transportation Agency and San Francisco Department of Public Works to ensure that adequate access is maintained for emergency service providers. The project would be built to the appropriate standards for fire prevention and safety. Therefore impacts to public services would be less than significant, and the project would not contribute to a cumulatively significant impact.

Recreation

As discussed in Section 5.15, the Proposed Project would not cause a substantial increase in the use of or physical deterioration of parks or recreational facilities. The project would have no effects on recreation and would not contribute to cumulative effects associated with other projects.

Transportation/Traffic

As discussed in Section 5.16, the Proposed Project would result in a less than significant increase in traffic and a less than significant impact to the level-of-service for designated roads or highways. Some road closures and one-way traffic controls would be required and would potentially decrease traffic flow, parking availability, and reduce LOS designations. Construction of the projects listed in Table 5.19-1 would likely also result in an increase in traffic and potential road closures in the areas adjacent to or near the Proposed Project. PG&E would coordinate traffic with the SFMTA, follow the recommendations of the California Joint Utility Traffic Control Manual, and would apply for permits from the City as required. Other construction projects would also be required to coordinate traffic with the SFMTA and apply for permits from the City and abide by the permit requirements. Implementation of APM TR-1 and all the required permits would reduce the contribution of the Proposed Project to cumulative traffic impacts to less than significant. Similarly, PG&E would coordinate with the U.S. Coast Guard to establish a Vehicle Safety Zone for the cable laying work to reduce impacts due to marine traffic to less than significant.

Construction of the project could result in closure of parking spaces on Spear Street, Folsom Street, and 23rd Street. These closures would be temporary in nature and would not constitute a long-term loss of parking capacity. The number of parking closures at a given time would be very small relative to the parking capacity in the Rincon Hill and Central Waterfront areas and the contribution of the project to a cumulative loss of parking would be temporary and less than significant.

The Proposed Project may result in a temporary impact to bikeways and short term disruptions to bus access that may require temporary relocations. PG&E would obtain all necessary road permits prior to construction and would comply with all the applicable conditions of approval. PG&E's Traffic Management Plan (to be prepared in consultation with the City) would establish methods for minimizing construction effects on transit service and bike facilities to ensure that PG&E's contribution to cumulative impacts would be less than significant.

Utilities and Service Systems

As noted in Section 5.17, the Proposed Project would not exceed wastewater treatment requirements and would result in a less than significant cumulative contribution to wastewater treatment facilities. Water would be obtained from existing supplies and would be sufficient for the short duration construction, therefore there would be no impacts to water or wastewater treatment facilities resulting in the need for new or expanded facilities and no contribution to the cumulative need for new or expanded facilities. The Proposed Project would not require the construction of new stormwater drainage facilities or expansion of existing facilities and would not contribute to the cumulative need for new or expanded facilities.

An estimated 6,300 cubic yards of excavated material from the trench and vault locations would be hauled off-site for disposal to an appropriately licensed facility or hauled to a commercial soil recycling facility, and 8,000 cubic yards of soil that is known to be contaminated would need to be exported for the proposed switchyard. The landfills serving the project area would have adequate capacity for the expected waste and the project's contribution to a cumulative increase in waste would be minimal and less than significant. The Proposed Project would comply with federal, state, and local statutes and regulations related to solid waste so would have no contribution to the cumulative impacts to the statutes and plans.

Construction of the Proposed Project has the potential to disrupt existing collocated utility lines during underground and submarine construction. Similar disruptions may occur during construction of residential or commercial facilities that require ground disturbance adjacent to existing utility systems. With implementation of Mitigation Measure UT-1, the contribution of these impacts would not be cumulatively considerable.

5.19.3 Results of Mandatory Findings

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

LESS THAN SIGNIFICANT WITH MITIGATION. Project construction would use existing city streets and disturbed areas for the onshore portions of the route. There are no wetlands along the route and vegetation is largely limited to ornamental shrubs and trees. The potential to degrade the environmental quality for the onshore portion of the project is very low. Habitat in the onshore project area is generally marginal for special-status wildlife.

The offshore portion of the project would pass through natural and artificial intertidal, subtidal, and open-water habitats. There are least 16 federally managed fish species (Magnuson-Stevens Act, see Applicable Regulations) that may be present in the project area. Additionally, the San Francisco Bay is federally designated as critical habitat for the federally listed southern Distinct Population Segment (DPS) of North American green sturgeon and for the federally listed DPS of Central California Coast steelhead.

Project-related work would require mitigation to provide environmental awareness training, protect San Francisco Bay special-status fish, marine mammals, and aquatic habitat, limit the work window to avoid special status species spawning times, avoid impacts to nesting birds, and protect the western red bat (APM BIO-1 through APM BIO-5 and Mitigation Measures B-1, B-2, and B-3). Impacts to aquatic habitat for special-status marine species would be reduced to less than significant by APM BIO-1, APM BIO-3, APM BIO-4, APM BIO-5, and APM BIO-6 and Mitigation Measures B-1, B-2, and B-3. Potential for direct take of species, population, or community through habitat loss or modification is unlikely, though direct impacts may occur if species encounter equipment and construction personnel during the cable installation and HDD. Impacts would be less than significant with implementation of Mitigation Measure B-1, and APM BIO-1, APM BIO-3, APM BIO-4, APM BIO-5, and APM BIO-6.

As noted in Section 5.5, the project would impact one historical building, Station A, and would incorporate measures (APMs CUL-7 and CUL-8) to document and record the setting of Station A and its few remaining elements, resulting in a less than significant change. Areas of low, moderate, and high prehistoric and historical resources sensitivity occur within the proposed route. APMs CUL-1 through CUL-5 and Mitigation Measure C-1 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. These measures would ensure that the Proposed Project would not eliminate examples of major period of California history or prehistory.

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, effects of other current projects, and the effects of probable future projects.)

LESS THAN SIGNIFICANT WITH MITIGATION. A cumulative impact consists of an impact that is created as a result of the combination of the Proposed Project together with other projects causing related impacts. An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact (CEQA Guidelines §15130(a)(3)).

Sections 5.19.1 and 5.19.2 indicate that the Proposed Project has the potential to result in cumulative impacts to some resources. For all potentially significant cumulative impacts, implementation of APMs and mitigation measures would reduce the Proposed Project's contribution to cumulative impacts to less than cumulatively considerable as described above.

c. Does the project have environmental effects, which would cause substantial adverse effects on human beings, either directly or indirectly?

LESS THAN SIGNIFICANT WITH MITIGATION. The preceding sections of this Initial Study discuss various types of impacts that could have adverse effects on human beings, including:

- Changes to air quality during project construction resulting from fugitive particulate matter emissions, diesel particulate matter emissions, and exhaust emissions (see Section 5.3, Air Quality)
- Potential release of hazardous materials associated with construction during transport, use, and disposal (see Section 5.8, Hazards and Hazardous Materials)
- Noise and vibration generated by project construction activities (see Section 5.12, Noise)
- Disrupt existing utility systems or cause a collocation accident (see Section 5.17, Utilities and Service Systems).

These are primarily impacts associated with the limited duration of project construction activities. Each type of impact with the potential to cause substantial adverse effects on human beings has been evaluated, and this Initial Study concludes that all of these potential impacts are either less than significant or can be mitigated to a less than significant level with the implementation of measures presented herein (see also Section 6, Mitigation Monitoring Plan, for a complete listing of the mitigation measures including Applicant Proposed Measures). Therefore, the Proposed Project does not involve any activities, either during construction or operation, which would cause significant adverse effects on human beings that cannot be readily mitigated to a less than significant level. The proposed operation and maintenance activities would be the same as current operation and maintenance practices of similar lines in the area which have minimal impacts on human beings. The potential beneficial effects of the project include improving the reliability of the existing transmission system in San Francisco.

6. Mitigation Monitoring Plan

PG&E proposes to construct and operate the Embarcadero-Potrero 230 kV Transmission Project (Proposed Project). The Initial Study assesses the Proposed Project's potential environmental effects. The Initial Study relies on information in the Proponent's Environmental Assessment (PEA), project site visits, and supplemental analysis. The majority of the Proposed Project's potential impacts would occur during project construction. Within PG&E's application, Applicant Proposed Measures (APMs) were proposed to reduce potentially significant adverse impacts related to project construction and operation.

The purpose of this Mitigation Monitoring Plan is to ensure effective implementation of each APM, as well as the mitigation measures identified by the Initial Study and imposed by the CPUC as part of project approval.

This Mitigation Monitoring Plan includes:

- The APMs and mitigation measures that PG&E must implement as part of the Proposed Project;
- The actions required to implement these measures;
- The monitoring requirements; and
- The timing of implementation for each measure.

The CPUC will use this MMP as the framework for a Mitigation Monitoring, Compliance, and Reporting Program (MMCRP). The MMCRP will be created by the CPUC to describe the monitoring process for construction of the project that has been approved by the CPUC and to formalize protocols to be followed prior to and during construction by CPUC third-party environmental monitors (CPUC EMs) and PG&E project staff. The MMCRP will include, but will not be limited to, the following topics:

- Agency Jurisdiction
- Roles/Responsibilities
- Communication
- Compliance Verification and Reporting
- Project Changes

A CPUC-designated environmental monitor will carry out all construction field monitoring to ensure full implementation of all measures. In all instances where non-compliance occurs, the CPUC's designated environmental monitor will issue a warning to the construction foreman and PG&E's project manager. Continued non-compliance shall be reported to the CPUC's designated project manager. Any decisions to halt work due to non-compliance will be made by the CPUC. The CPUC's designated environmental monitor will keep a record of any incidents of non-compliance with mitigation measures, APMs, or other conditions of project approval. Copies of these documents shall be supplied to PG&E and the CPUC.

Final language of the MMCRP will be made in consultation with PG&E. Drafted language for the project variance and dispute resolution protocols are provided below.

6.1 Minor Project Changes or Variances

The CPUC Project Manager along with the CPUC Monitoring Team will ensure that any process to consider minor project changes that may be necessary due to final engineering or variances or deviations from the procedures identified under the monitoring program are consistent with CEQA requirements. No minor project changes or variances will be approved by the CPUC if they are located outside of the geographic boundary of the project study area. Variances are limited to minor project changes that will not trigger other permit requirements unless the appropriate agency has approved the change, and that clearly and strictly comply with the intent of the mitigation measure or applicable law or policy. This determination is ministerial, and shall be made by the CPUC Project Manager. PG&E shall seek any other project refinements by a petition to modify. Should a project change or refinement require a Petition for Modification, supplemental environmental review under CEQA will be required.

Any proposed deviation from the approved project, adopted mitigation measures, APMs, and correction of such deviation, will be reported immediately to the CPUC Project Manager for his or her review. The CPUC Monitoring Team will review the variance request to ensure that all of the information required to process the minor project change is included, and then forward the request to the CPUC Project Manager for review and approval. The CPUC Project Manager may request a site visit from the CPUC EM, or may need additional information to process the variance. In some cases, project refinements may also require approval by jurisdictional agencies. In general, a minor project change request must include the information listed below.

- Detailed description of the location, including maps, photos, and/or other supporting documents;
- How the variance request deviates from a project requirement;
- Biological resource surveys or verification that no biological resources would be significantly impacted;
- Cultural resource surveys or verification that no cultural resources would be significantly impacted; and
- Agency approval (if necessary).

6.2 Dispute Resolution

It is expected that the Mitigation Monitoring Plan will reduce or eliminate many potential disputes. However, even with the best preparation, disputes may occur. Issues should be first addressed at the field level informally between the CPUC EMs and PG&E's EMs at the regular progress meetings. Questions may be raised to the PG&E Project Environmental Manager or PG&E Project Construction Manager. Should the issue persist or not be resolved at these levels, the following procedures will be used:

- **Step 1.** Disputes and complaints (including those of the public) should be directed first to the CPUC Project Manager for resolution. The Project Manager will attempt to resolve the dispute informally. Should this informal process fail, the CPUC Project Manager will inform PG&E prior to initiating Step 2.
- **Step 2.** Should this informal process in the field fail, the CPUC Project Manager may issue a formal letter requiring corrective actions to address the unresolved or persistent deviations from the Proposed Project or adopted MMP.
- **Step 3.** If a dispute or complaint regarding the implementation or evaluation of the Program or mitigation measures cannot be resolved informally or through a letter request, any affected participant in the dispute or complaint may file a written "notice of dispute" with the CPUC Executive Director. This notice should be filed in order to resolve the dispute in a timely manner, with copies concurrently served on other affected participants. Within 10 days of receipt, the Executive Director or designee(s) shall meet or confer with the filer and other affected participants to resolve the dispute. The Executive Director shall issue an Executive Resolution describing his/her decision, and serve it on the filer and other affected participants.
- **Step 4.** If one or more of the affected parties is not satisfied with the decision as described in the Resolution, such party(ies) may appeal it to the Commission via a procedure to be specified by the Commission.

Parties may also seek review by the Commission through existing procedures specified in the CPUC Rules of Practice and Procedure for formal and expedited dispute resolution, although a good faith effort should first be made to use the foregoing procedure.

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
	Aesthetics		
APM 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.	Review design and layout to ensure that lighting spillover is minimized from off-site locations	Prior to construction and during operation
	Air Quality		
APM AQ-1	**Minimize Fugitive Dust.** Consistent with Table 2 of the [1999] 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.	Ensure particulate matter emissions are minimized during construction	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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.	Ensure emissions from construction equipment exhaust are reduced	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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 Airborne Toxic Control Measure (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	Ensure soil sample analysis and implementation of measures, if necessary, to minimize the potential for naturally occurring asbestos emissions	Prior to and during construction
Construction-Phase Air Quality	**MM A-1: Achieve minimum emission standards.** This measure incorporates and supplements portions of APM AQ-2, Minimize Construction Exhaust Emissions. PG&E shall maintain all construction equipment properly in accordance with manufacturer's specifications, and ensure that equipment is checked by a certified visible emissions evaluator. All off-road construction diesel engines not registered under the CARB Statewide Portable Equipment Registration Program shall meet at a minimum the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations (CCR) Title 13, Chapter 9, Sec. 2423(b)(1). All marine commercial harbor craft, except gasoline-powered small craft, shall meet at a minimum the Tier 2 Marine Engine Emission Standards (CCR Title 17, Sec. 93118.5).	Ensure proper maintenance and certification of equipment to minimize exhaust emissions	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
	Biological Resources		
APM 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.	Avoid biological resources; review training and brochure; ensure construction personnel sign an environmental training attendance sheet.	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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.	Survey for nesting birds in accordance with CDFW guidelines and submit nest survey results to CPUC, if requested; monitor birds and limit duration or location of work, if necessary [Superseded by MM B-4]	Prior to and during construction
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.	Conduct hydroplow cable installation between March 1 and November 30, if feasible, or ensure coordination of additional measures with NMFS, USFWS, and CDFG	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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.	Monitor hydroplow and HDD connection activities and stop work for 2 weeks if herring spawning sites are observed within 660 feet of the work site	During construction
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.	Ensure compliance with conditions and requirements of permits	Prior to construction
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.	Ensure mesh screens are installed on water jet intakes [Supplemented by MM B-3]	Prior to and during construction
Special-Status Species	**MM B-1: Implement an Invasive Marine Species Control Plan**. PG&E shall develop and implement an Invasive Marine Species Control Plan prior to any in-water work. The plan shall include measures designed to effectively limit the introduction and spread of invasive marine species. PG&E shall submit this plan to the CPUC for approval at least 60 days before the start of marine activities. Vessels originating outside San Francisco Bay shall follow existing compliance measures established by the California State Lands Commission as part of the Marine Invasive Species Program, relating to hull fouling and ballast water control. In addition, if used outside the San Francisco Bay area prior to use on this project, the hydroplow and associated equipment shall be examined and any invasive species handled and disposed of according to the developed plan. Similarly, if the equipment is to be used outside the San Francisco Bay after this use, the equipment shall be examined and cleaned prior to leaving the area. PG&E shall coordinate plan preparation with the CPUC, U.S. Coast Guard, U.S. Army Corps of Engineers, National Marine Fisheries Service [NMFS], Regional Water Quality Control Board, and California Department of Fish and Wildlife [CDFW] as appropriate. The plan shall include: environmental training for all crew members working in marine areas addressing invasive marine species and actions to be taken to prevent release and spread of invasive marine species. Training shall include procedures for safe removal and disposal of any invasive species found on project equipment. Before and after boats and equipment leave the water, a qualified biologist (approved by the CPUC) shall assist crew members in removing plants, plant debris, and any other potentially invasive species.	Verify contents of Invasive Marine Species Control Plan; observe use and condition of equipment according to the plan	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
Special-Status Species	**MM B-2: Protect marine mammals from high noise levels.** PG&E shall consult with the National Marine Fisheries Service (NMFS) to determine whether Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) for marine mammals is necessary. If NMFS determines that an IHA or LOA is not necessary, PG&E shall submit evidence of this determination to the CPUC prior to the start of marine construction activities. ***Monitoring.*** PG&E shall prepare and implement a Marine Mammal Monitoring Plan. PG&E shall submit this plan to the CPUC for approval before the start of marine activities. The Marine Mammal Monitoring Plan shall include the following elements: ▪ Establishment of an appropriate buffer zone around the work area, generally 400 feet or as defined in consultation with NMFS, that would require work be slowed or otherwise modified if the work approaches a marine mammal within the established buffer zone. ▪ A qualified biologist (approved by the CPUC) shall be on board the hydroplowing ship during construction. ▪ The qualified biologist shall monitor marine mammal presence and behavior in the vicinity of the ship and the surface above hydroplow operations. ▪ The qualified biologist shall have the authority to slow or stop work, if safe to do so, and shall consult with the CPUC and NMFS about the implementation of additional minimization measures if, based on observations, project construction appears to be disrupting marine mammal behavior in ways that indicate harassment or injury. ▪ Any disruption of marine mammal behavioral patterns shall be reported to the CPUC and NMFS within two working days with a description of actions taken to curtail work and reduce noise source levels and a demonstration that the disruption caused no potential for injury or mortality. ▪ PG&E shall submit weekly reports of marine mammal observations to the CPUC during marine construction activities. As an alternative to preparing and implementing the Marine Mammal Monitoring Plan specified in this mitigation measure, PG&E may provide adequate evidence, to the CPUC for approval at least 30 days before the start of marine activities, based upon actual data collected for this project or other projects using similar equipment in a similar submarine environment, that demonstrates to the satisfaction of the CPUC that underwater noise source levels generated by the project hydroplow and marine activities cannot not be reasonably expected to exceed the 180 dB threshold recently used by NMFS for marine mammal protection.	Review information on noise source levels; verify contents of Marine Mammal Monitoring Plan; observe buffer zones and modifications to work practices; review report of behavioral patterns	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
Special-Status Species	**MM B-3: Protect marine species**. PG&E shall consult with CDFW to obtain an Incidental Take Permit for longfin smelt or a determination from the agency that the project is not likely to adversely affect longfin smelt. ***Fish screens.*** As stated in APM BIO-6, all hydroplow water jet intakes shall be covered with a mesh screen or screening device to minimize potential for impingement or entrainment of fish species, especially longfin smelt. Additional requirements to minimize or prevent entrainment and impingement are also required to supplement APM BIO-6: ▪ The mesh screen or screening device shall comply with applicable state (CDFW) and federal (NMFS) criteria for screening intakes such as those found in NMFS's 1996 Juvenile Fish Screen Criteria for Pump Intakes or as required by NMFS and CDFW. ***Monitoring.*** A qualified biologist (approved by CPUC) shall verify that the screens are in place at the beginning of each hydroplow work period and examine them for impinged longfin smelt or other fish species at the end of each work period, or whenever the screens are cleaned or the hydroplow is raised out of the water during the cable laying. Injury or mortality shall be reported to CPUC within two working days, with a discussion of actions taken to prevent or minimize any additional longfin smelt injury or mortality or as otherwise determined with CDFW and NMFS. Any injury or mortality of longfin smelt shall also be reported as determined in permitting discussions with CDFW and NMFS.	Verify use and condition of specified screens before and after each work period; review report of injury or mortality	Prior to and during construction
Special-Status Species	**MM B-4: Avoid impacts to nesting birds.** This measure supersedes APM BIO-2. If onshore construction activities occur during the avian nesting season, a preconstruction survey for nesting birds shall be conducted by a qualified wildlife biologist (PG&E employees or contractors, approved by the CPUC) within 7 days prior to the start of noise-generating construction or vegetation trimming or removal activities in any new work area. Surveys shall cover all public areas within 50 feet of work sites. For San Francisco County, the avian nesting season regularly occurs between February 15 and August 31, but a survey may be appropriate earlier or later depending on species, location, and weather conditions as determined by the qualified wildlife biologist. Work areas that cause no appreciable increase in ambient noise, such as where work is performed manually, by hand, or on foot and activities that cause no observable disturbances to nesting birds (e.g., operating switches, driving on access roads, normally occurring activities at substations, staging or laydown areas) would not warrant a preconstruction survey. ***Protective measures for birds.*** If an active bird nest for a species covered by the Migratory Bird Treaty Act or California Fish and Game Code is found within 50 feet of project work areas, the qualified biologist shall determine appropriate protective measures to reduce the likelihood of nest failure. Protective measures for active nests shall include one or more of the following: avoiding or limiting certain project-related activities within a designated buffer zone surrounding the nest, shielding of the nest from project disturbance using a temporary soundwall or visual screen, or other shielding method as appropriate. The width of the buffer zone (in which work may not occur) shall be based on the disturbance tolerance and conservation status of the species, and	Survey and establish buffers for nesting birds	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
	the nature of planned construction activities and other human activities in the immediate area. Buffer zones of less than 50 feet shall be allowed only when planned construction activities involve relatively low disturbance or birds have demonstrated tolerance of noise and disturbance. Buffers shall not apply to construction-related vehicle or pedestrian traffic using city streets and sidewalks. As appropriate, exclusion techniques may be used for any construction equipment that is left unattended for more than 24 hours to reduce the possibility of birds nesting in the construction equipment. An example exclusion technique is covering equipment with tarps. Bird species found building nests within the work areas after specific project activities begin may be assumed tolerant of that specific project activity; the CPUC approved, qualified biologist shall implement an appropriate buffer or other appropriate measures to protect such nests, after taking into consideration the position of the nest, the bird species nesting on site, the type of work to be conducted, and duration of the construction disturbance. ***Protective measures for special-status birds.*** If an active nest for a special-status bird is found, PG&E shall record the position of the nest in the monitoring report and notify the CPUC through the reporting process outlined below. The qualified biologist shall implement buffers and set other protective measures (described above), as appropriate, to protect special-status nesting birds from construction activities in consultation with CPUC, and as appropriate the California Department of Fish and Wildlife (CDFW) and/or United States Fish and Wildlife Service (USFWS). Buffer zones of less than 50 feet shall be allowed only when planned construction activities involve relatively low disturbance or birds have demonstrated tolerance of noise and disturbance. Requests for buffers of less than 50 feet for special-status nesting birds must be submitted to the CPUC's independent biologist(s) for review. The CPUC's independent biologist shall respond to PG&E's request for a buffer reduction (and buffer reduction terms) within one business day; if a response is not received, PG&E can proceed with the buffer reduction. If nesting birds in the presence of the CPUC-approved qualified biologist show signs of intolerance to construction activities within a reduced buffer zone, the qualified biologist shall reinstate the recommended buffer. The recommended buffer may only be reduced again following the same process, as identified above, and after the CPUC-approved, qualified biologist has determined that the nesting birds are no longer exhibiting signs of intolerance to construction activities. Nests shall be monitored daily by the qualified biologist when construction is active at that location. Any potentially significant construction-related disturbance shall be reported to CPUC, CDFW, and USFWS. ***Monitoring.*** Active nests shall be monitored at least once daily during construction until nestlings have fledged and dispersed or until nest failure has been documented. Daily nest checks shall be at least 30 minutes or more as determined by the qualified biologist 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 qualified biologist shall record the 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. The qualified biologist		

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
	shall 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. If the qualified biologist determines that project activities are contributing to nest disturbance, they shall notify CPUC (and CDFW/USFWS as appropriate in the case of special-status bird nests) and coordinate with the Construction Manager to limit the duration or location of work, and/or increase appropriate protective measures (as described above). ***Reporting.*** If there are active nests present within 50 feet of the project area during construction, a weekly written report shall be submitted to CPUC. A final report shall be submitted to CPUC at the end of each nesting season summarizing all nest monitoring results and nest outcomes for the duration of project construction. No avian reporting shall be required for construction occurring outside of the nesting season and if construction activities do not occur within a reduced buffer during any calendar month. Nests located in areas of existing human presence and disturbance, such as in yards of private residences, or within commercial and or industrial properties are likely acclimated to disturbance and may not need to be monitored, as determined by the CPUC-approved, qualified biologist and approved by the CPUC's independent biologist. ***Permits.*** Prior to the start of construction, PG&E may obtain a permit authorized by Section 3503 and/or Section 3503.5 of the California Fish and Game Code, or by any regulation adopted pursuant thereto, pertaining to nesting birds. If PG&E obtains such a permit under the above authorities, where that permit conflicts with the measures outlined above, the conditions of the permit shall govern.		

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
	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.	Review training program materials and ensure construction personnel sign an environmental training attendance sheet.	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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.	Avoid cultural resources or ensure that any discovered cultural resources are assessed and treated appropriately	During construction
APM CUL-3	**Construction Monitoring.** A professional archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards will monitor all project-related on-shore excavation that is within an area of moderate to high sensitivity for prehistoric or historical buried resources, as such areas are presented in PEA Appendix D (Nolte et al. 2012). This shall include monitoring areas within 167 feet (50 meters) of recorded or previously identified prehistoric and historical-era sites or features, APM CUL-3 will be guided by an Archaeological Monitoring and Inadvertent Discovery Plan, which will include the framework for evaluation and treatment of any unanticipated discoveries described in APM CUL-4. In addition to the monitoring archaeologist, a qualified maritime archaeologist will be on call during construction to assist with implementation of the Archaeological Monitoring and Inadvertent Discovery Plan should maritime resources be identified during excavation. If appropriately qualified, the same person may act as both the monitoring archaeologist and maritime archaeologist. This APM CUL-3 in combination with APM CUL-4 will ensure that archaeological resources will not be impacted during construction without adequate evaluation and any necessary actions (as further detailed in APM CUL-4 and the Archaeological Monitoring and Inadvertent Discovery Plan) to preserve information regarding impacted resources. Site assessment procedures and data recovery or other measures will be developed as part of the Archaeological Monitoring Plan and applied during the monitoring process.	Monitor for cultural resources within areas of moderate to high sensitivity for prehistoric or historical buried resources; assist with implementation of the Archaeological Monitoring and Inadvertent Discovery Plan	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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.	Avoid unanticipated cultural resources or ensure implementation of data recovery or other appropriate treatment measures, if warranted [Superseded by MM C-1]	During construction
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).	Ensure work within 100 feet of the find stops and that provisions in Health and Safety Code Sect. 7050.5 and Public Resources Code Sect. 5097.24 are followed appropriately.	During construction
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 PEA Appendix D (Nolte et al. 2012) 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.	Review training materials and ensure construction personnel sign an environmental training attendance sheet; review structural engineering results for Station A	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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, and the brick wall that fronts Station A and that serves as a visual barrier will be partially or completely removed. Prior to construction, the setting and exterior of the Station and brick wall 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.	Review Station A setting and exterior documentation	Prior to construction
APM CUL-8	**Apply Secretary of the Interior Standards for the Treatment of Historic Properties to Brick Wall Modifications.** The gate in the brick wall that fronts Station A will be widened and the wall removed or modified to allow access for large transformer equipment and future maintenance activities. Modifications to or removal of the wall will follow the Secretary of the Interior Standards for the Treatment of Historic Properties (available at http://www.nps.gov/hps/tps/standguide/) and will be designed to be compatible with the historic character of Station A. PG&E will submit a draft of its design for the brick wall modifications to the Commission no less than 30 days prior to any alteration of the wall.	Review design of brick wall modification and ensure it follows the Secretary of the Interior Standards	Prior to construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
Preservation of Unanticipated Discoveries	**MM C-1: Unanticipated Discoveries of Cultural Deposits.** This mitigation supersedes APM CUL-4. 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. The CPUC-approved cultural resources specialist shall be contacted immediately to examine the discovery and determine if further investigation 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 subject to further impact, the CPUC-approved cultural resource specialist/archaeologist shall evaluate the resource and determine whether it is: (1) eligible for the CRHR (and thus a historical resource for purposes of CEQA); or (2) a unique archaeological resource as defined by CEQA. If the resource is determined to be neither a unique archaeological nor an historical resource, work may commence in the area. If the resource meets the criteria for either an historical or unique archaeological resource, or both, work shall remain halted, and the cultural resources specialist/archaeologist shall consult with CPUC staff regarding methods to ensure that no substantial adverse change would occur to the significance of the resource pursuant to CEQA Guidelines Section 15064.5(b). Preservation in place, i.e., avoidance, is the preferred method of mitigation for impacts to historical or unique archaeological resources. Alternative methods of treatment that may be demonstrated by the CPUC to be effective include evaluation, collection, recordation, and analysis of any significant cultural materials in accordance with a Cultural Resources Management Plan prepared by the CPUC approved qualified cultural resource specialist/archaeologist. The methods and results of evaluation or data recovery work at an archaeological find shall be documented in a professional level technical report to be filed with CHRIS. Work may commence upon completion of treatment, as approved by the CPUC.	Avoid unanticipated cultural resources or ensure implementation of data recovery or other appropriate treatment measures, if warranted	During construction
Known and Potential Cultural Resources	**MM C-2**: **Avoid known and potential shipwreck locations.** This measure incorporates and supplements portions of APM CUL-2, Resource Avoidance. During installation of the submarine cable, PG&E and its contractors shall map the as-built alignment of the cable in relation to known cultural resources, and the contractors shall ensure that the cable passes at least 100 feet to the west of the known shipwreck located in the northeastern portion of the marine geophysical survey area and mapped on NOAA Chart no.18650. In addition, prior to the installation of the cable, PG&E and its contractors shall map a 50 foot buffer around the magnetic anomaly identified by OSI as anomaly no. M63 in the southern half of the marine geophysical survey area and located at 6019099E, 2106491N, as the anomaly may result from the remains of a shipwreck buried beneath the bay floor in that location. PG&E and its contractors shall ensure that no sediment disturbing excavation or hydroplowing is conducted within the 50 foot buffer zone. If the project cannot be routed around the anomaly, additional evaluation and mitigation as detailed in Mitigation Measure C-1, for unanticipated discoveries, and detailed in the Unanticipated Discoveries Plan may be necessary prior to excavation.	Avoid known shipwreck and magnetic anomaly, review maps of buffer areas and as-built alignment	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
	Paleontological Resources		
APM 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.	Review training program materials and ensure construction personnel sign an environmental training attendance sheet.	Prior to and during 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.	Stop or redirect work to avoid unanticipated paleontological resources prior to assessment	During construction
	Geology and Soils		
APM 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.	Ensure design of the project is appropriate for the conditions; review project design	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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.	Ensure design of the project is based on current seismic design practices and guidelines; review project design	Prior to and during construction
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).	Ensure BMPs are implemented to minimize and avoid surface runoff, erosion, and pollution	Prior to and during construction
	Greenhouse Gas Emissions		
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.	Ensure low emitting engines are used and idling time is minimized	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
APM GHG-2	**Avoid and Minimize Potential SF6 Emissions.** PG&E will include Potrero Switchyard in PG&E's system-wide SF6 emission reduction program, which includes inventorying and monitoring system-wide SF6 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 SF6 leakage rate of 0.5 percent per year or less and will be maintained in accordance with PG&E's maintenance guidelines.	Potential for SF_6 leaks is minimized according to a leak reduction standard	Prior to construction and during operation

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
	Hazards and Hazardous Materials		
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), 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 PEA Section 3.9, Hydrology and Water Quality. ▪ Stopping work at that location and contacting the CUPA (SFDPH Environmental Health Section; see PEA 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. *(Also see APM WQ-1 and APM WQ-3 in PEA Section 3.9.4.2)*	Review training program materials and ensure construction personnel sign an environmental training attendance sheet; ensure that contaminated soil and hazardous materials and wastes are handled, stored, and disposed of in accordance with all applicable regulations; observe availability of material safety data sheets	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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.	Review project-specific health and safety plan	Prior to and during construction and operation
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 PEA Section 3.8.3.1), as well as the Maher Ordinance (see PEA Section 3.8.2.1).	Ensure adherence to Applicable Site-specific RMPs and SMPs	During construction
APM HM-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 up, it will be removed and transported for disposal, according to applicable regulations. *(Also see APM WQ-4.)*	Ensure emergency spill supplies and equipment are on the project site and appropriate areas are lined and bermed	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
APM HM-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. *(Also see APM WQ-5.)*	Ensure work stoppage if suspected hazardous materials are encountered; ensure development of a storage tank decommissioning work plan, if required	Prior to and during construction
APM HM-6	**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. *(Also see APM WQ-6 and APM WQ-7.)*	Ensure HDD monitoring for loss of drilling fluids and development of a Frac-out Plan	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
APM HM-7	**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. *(Also see APM WQ-8.)*	Review Sampling and Analysis Plan and results of sampling	Prior to and during submarine cable installation

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
	Hydrology and Water Quality		
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. 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.	Ensure a SWPPP is prepared and implemented to minimize construction impacts on surface water and groundwater quality	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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 PEA 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.	Review training program materials and ensure construction personnel sign an environmental training attendance sheet.	Prior to and during construction
APM WQ-3	**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. *(Also see APM HM-1.)*	Ensure construction personnel sign an environmental training attendance sheet; observe storage of chemicals and availability of material safety data sheets	Prior to and during construction
APM WQ-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. *(Also see APM HM-4.)*	Ensure emergency spill supplies and equipment are on the project site and appropriate areas are lined and bermed	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
APM WQ-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. *(Also see APM HM-5.)*	Ensure soil information is provided to construction crews; ensure work stoppage if suspected hazardous materials are encountered and appropriate testing, handling, and disposal	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
APM WQ-6	**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 PEA 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. *(Also see APM HM-6 and APM WQ-7.)*	Ensure HDD monitoring for loss of drilling fluids and development of a Frac-out Plan; observe installation of berms and pits on land and use of dyes, among other monitoring measures; ensure appropriate containment and clean-up, if necessary	Prior to and during construction
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.	Observe voids filled with grout or similar material	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
APM WQ-8	**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. *(Also see APM HM-7.)*	Review Sampling and Analysis Plan and results of sampling	Prior to and during submarine cable installation
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.	Ensure project site restoration	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
APM WQ-10	**Sediment Monitoring and Response Plan.** Estimates of the amounts of material that may be suspended will vary depending on the specific type of equipment to be used. During final design, the expected equipment type will be identified and an evaluation can be made of the amount of sediment expected to be suspended. Along with the sediment quality information being gathered as described in APM WQ-8 and APM HM-7, this information will be used to determine, in coordination with the RWQCB, allowable thresholds of turbidity in the area of operations. A Sediment Monitoring and Response Plan will be developed in coordination with the RWQCB, taking into account equipment and the results of sediment sampling, that will set monitoring distance and methodology, acceptable thresholds of turbidity compared to background, and adaptive operational controls that will be used to reduce sediment suspension. These controls may include, but are not limited to, increasing or decreasing the speed of cable installation operation, increasing or decreasing the operational jet nozzle pressure, adjusting the operational angle of the jet nozzles on the burial blade, and other operational parameters that may reduce sediment suspension.	Review and ensure appropriate controls are implemented based on the Sediment Monitoring and Response Plan	Prior to and during construction
	Land Use		
APM 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.	Review notices and ensure coordination	Prior to construction
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.	Review notices and ensure public liaison person and hotline	Prior to and during construction
	Noise		
APM 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.	Ensure implementation of barriers such that construction noise to nearby sensitive receptors is minimized	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
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.	Ensure implementation such that construction noise is minimized [Superseded by MM N-1]	During construction
APM NO-3	**Noise Minimization through Direction of Exhaust.** Equipment exhaust stacks and vents will be directed away from buildings where feasible.	Ensure implementation such that construction noise to nearby buildings and residents is minimized [Superseded by MM N-1]	During construction
APM NO-4	**Noise Minimization through Truck Traffic Routing.** Truck traffic will be routed away from noise-sensitive areas where feasible.	Ensure implementation such that noise-related complaints from nearby residents are minimized	During construction
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.	Review notification; noise-related complaints from nearby residents are minimized	During construction
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, and/or modify barriers to further reduce noise levels.	Ensure implementation of barriers such that HDD construction noise to nearby sensitive receptors is minimized; review nighttime monitoring results and ensure additional measures, if necessary	During construction
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.	Review reduction measures to ensure implementation such that construction noise to nearby buildings and residents is minimized	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
Underground Transmission Line Construction Noise	**MM N-1: Implement General Noise Control Measures**. PG&E shall implement the following general noise control measures in addition to APMs NO-1 to NO-7, with APMs NO-2 and NO-3 superseded: ▪ PG&E and contractors shall use equipment that incorporates noise-control elements into the design. ▪ PG&E and contractors shall ensure equipment exhaust stacks and vents are directed away from buildings. ▪ Where use of pneumatic tools, such as impact tools (e.g., jack hammers and pavement breakers), is unavoidable, a noise source screen such as a barrier around the activity using the tools, an external noise jacket, or an exhaust muffler on the compressed air exhaust shall be used and shall be designed to reduce noise levels from the source by 10 dBA. ▪ PG&E shall include noise control requirements in specifications provided to construction contractors. Such contract specifications would include, but not be limited to, performing all work in a manner that minimizes noise; use of equipment with effective mufflers; undertaking the most noisy activities during times of least disturbance to surrounding residents, day care operations, and commercial uses; and using haul routes that avoid residential buildings inasmuch as such routes are otherwise safely available. ▪ PG&E shall respond to and track complaints pertaining to construction noise. PG&E shall provide a complaint hotline phone number that shall be answered at all times during construction and designate an on-site construction complaint and enforcement manager for the project. The noise complaint and response process shall be described in the residential notifications required under APM NO-5 and posted publicly near work areas that are within 300 feet of residential buildings or day care operations.	Ensure implementation of specified noise control elements, contract language, and timely response and tracking of complaints with public posting near work areas	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
24-Hour HDD Construction Noise	**MM N-2: Obtain Special Permit for Nighttime HDD Noise.** This mitigation measure is to supplement and ensure enforceability of APM NO-6 for noise sources at the Embarcadero HDD Transition Area. ▪ PG&E shall apply to the San Francisco Director of Public Works and obtain a special permit for nighttime or 24-hour activity at the Embarcadero HDD Transition Area, consistent with Section 2908 of the Police Code. Prior to commencing construction of the HDD, PG&E shall provide to the CPUC a copy of the special permit or evidence that no permit is required by San Francisco. ▪ PG&E shall provide to the CPUC at least 7 days prior to commencing construction of the Embarcadero HDD Transition Area the results of actual ambient hourly (Leq) noise measurements for each hour between 8:00 p.m. to 7:00 a.m. at the edge of the nearest private property containing residential use obtained from monitored noise levels as specified in APM NO-6. ▪ PG&E and contractors conducting nighttime work at the Embarcadero HDD Transition Area, between 8:00 p.m. to 7:00 a.m., shall implement noise attenuation features, including acoustical barriers, blankets and enclosures as identified in APM NO-6, to achieve no more than 5 dBA above existing local ambient noise levels at the edge of the nearest private property containing residential use, based on 1-hour Leq. ▪ PG&E shall provide a report to the CPUC actions taken to reduce the duration or level of noise within 48 hours of monitoring noise levels found to be in excess of the ambient noise level by 5 dBA, at the edge of the nearest private property containing residential use, based on 1-hour Leq.	Review correspondence related to special permit, and review results of noise measurements to establish hour-by-hour baseline and measurements taken under APM NO-6	Prior to and during nighttime construction
	Traffic/Transportation		
APM 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	Review Traffic Management Plan; ensure traffic safety practices and coordination are implemented	During construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
	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.	Review notice and observe Vessel Safety Zone	Prior to and during marine construction
	Utilities and Service Systems		
APM 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.	Ensure knowledge of outcome of coordination with SFPUC in order to prevent damaging the storage box	Prior to and during construction

Table 6-1. Mitigation Monitoring Plan

Impact	Applicant Proposed Measure (APM) or Mitigation Measure	Monitoring Requirement	Timing of Action
Accidental Utility Service Disruptions	**MM UT-1: Protect underground utilities.** Prior to commencing construction of the underground transmission line, PG&E shall submit to the CPUC written documentation of the following: ▪ Construction plans designed to protect existing utilities, showing the dimensions and location of the finalized alignment as well as the corrosion and induced currents study; ▪ Records that the Applicant provided the plans to the City and County of San Francisco for review, revision and final approval; ▪ Construction plans approved by the City and County of San Francisco detailing the steps taken to prevent damage to two large SFPUC storm sewers, including but not limited to an appropriate shoring plan, work zone restrictions, and setbacks for the adjacent structures, at the following locations: (1) in the intersection of Spear and Folsom; and (2) at the end of the route as it turns to enter Embarcadero Substation; ▪ Evidence of coordination with all utility owners within the approved right-of-way, including their review of construction plans, results of the induced current and corrosion potential analysis, and a description of any protection measures or compensation to be implemented to protect affected facilities; ▪ Copy of the Applicant's database of emergency contacts for utilities that may be in close proximity or require monitoring during construction of the project; ▪ Evidence that the project meets all applicable local requirements; ▪ Evidence of compliance with design standards; and ▪ Copies of any necessary permits, agreements, or conditions of approval.	Review documentation of construction plans and evidence of coordination and compliance with requirements, permits or agreements to minimize accidental disruptions	Prior to and during construction

Note: Applicant Proposed Measures (APMs) appear in the Proponent's Environmental Assessment (PG&E, 2012a).

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