D.7 Hydrology and Water Quality

D.7.1 Environmental Setting for the Proposed Project

General Setting

The Proposed Project is located entirely on the San Francisco peninsula. Average annual rainfall within the project area ranges from approximately 19 inches at San Mateo (WRCC, 2002) to approximately 35 inches per year at the San Andreas Lake (San Francisco Planning Department, 2000). Precipitation is seasonal with dry summers and wet winters. Approximately 85% of the years' total precipitation falls during the five month period from November to March.

The Peninsula Watershed primarily comprises the watersheds of San Mateo, Pilarcitos, and San Andreas Creeks. As a result of the construction of dams and the San Francisco Public Utilities Commission water system, drainage within these watersheds has been altered. The watersheds are now interconnected and drain to three reservoirs that store water for use in the San Francisco metropolitan area. The three reservoirs are: (1) Upper and Lower Crystal Springs Reservoirs; (2) Pilarcitos Reservoir and Creek; and (3) San Andreas Lake (San Francisco Planning Department, 2000). Approximately 14 miles of the proposed power line is within or immediately adjacent to portions of the Peninsula Watershed that drain into the Upper and Lower Crystal Springs Reservoirs and San Andreas Lake (see Figures D.7-1a through D.7-1c).

Upper Crystal Springs Reservoir was formed in 1877 with the construction of Upper Crystal Springs Dam, which is now located between the Upper Crystal Springs and Lower Crystal Springs Reservoirs. This dam now supports the roadbed and no longer retains water. A culvert underneath the roadbed connects the Upper and Lower Crystal Springs Reservoirs. Lower Crystal Springs Reservoir was formed in 1890 by constructing Crystal Springs Dam on San Mateo Creek. The combined Crystal Springs Reservoir has a catchment area of 22.5 square miles (San Francisco Planning Department, 2000).

The Crystal Springs Reservoirs have a combined capacity of 69,320 acre-feet (ac-ft), but are now operated at a capacity of 58,400 ac-ft due to dam safety requirements. Sedimentation has reduced the storage capacity of the Crystal Springs Reservoirs by about 20 percent since their construction (San Francisco Planning Department, 2000).

San Andreas Lake is located at the northern end of the Peninsula Watershed lands, above the San Andreas Dam, constructed in 1870. The catchment area of San Andreas Lake is 4.4 square miles, and the reservoir's capacity is 19,000 ac-ft. In addition, flows from the upper San Mateo Creek drainage area (about 2.5 square miles) can be conveyed to San Andreas Lake through Davis Tunnel. San Andreas Lake can also be used to store water from the Pilarcitos Reservoir and Crystal Springs Reservoir, including Hetch Hetchy water conveyed through the Bay Division Pipelines. Accumulated sedimentation has reduced the maximum storage capacity of the San Andreas Lake by about 20 percent since 1870.

Rivers and Streams

Streams draining into the Peninsula Watershed within the project area are relatively small, steep, and in a nearly natural condition. Much of the proposed alignment for the overhead portion of the Jefferson-Martin Transmission Line Project runs along the ridgeline between the Peninsula Watershed and adjoining watersheds that drain to San Francisco Bay. Pulgas Ridge and Buri Buri Ridge are two such ridges. Since the ridgeline is where natural water courses begin, most of the streams are small at the location of the crossings. See Figures D.7-1a through D.7-1d for watercourse crossings along the Proposed Project route.

Colma Creek, San Mateo Creek, and Flume Creek are the largest streams in the project area. Colma Creek is in the northern portion of the Proposed Project alignment. The watershed for Colma Creek includes portions of San Bruno Mountain as well as urbanized areas of Daly City, Colma, and South San Francisco. Colma Creek has a high degree of channelization to allow for the development of urban structures, approximately 63 percent, the highest in San Mateo County (San Francisco Planning Department, 2000). Colma Creek ultimately drains into San Francisco Bay.

San Mateo Creek generally flows west to east. Crystal Springs Dam controls flow that enters the eastern half of San Mateo Creek from Lower Crystal Springs Reservoir. The Proposed Project crosses the creek shortly downstream of the dam.

Flume Creek is a permanent stream flowing south from the San Andreas Lake to the Lower Crystal Springs Reservoir. The Proposed Project alignment does not cross this creek, but a portion of the transmission line would be within the Flume Creek watershed.

Guadalupe Canyon, which lies within the Guadalupe Valley watershed, is east of the Project Area between Visitacion Valley watershed and Colma Creek watershed. Guadalupe Canyon drains from west to east into the San Francisco Bay. Five small streams in this watershed cross the proposed transmission line alignment.

Floodplains

Portions of the proposed alignment in San Bruno and South San Francisco are the only portions of the project that can be positively identified as having proximity to a Federal Emergency Management Agency (FEMA) designated floodplain. Much of the project alignment is either not mapped for floodplains or designated as a "minimal flooding area" by FEMA. These "minimal flooding" designations do not necessarily mean the areas are free of flooding. Floodplains of varying magnitude occur with most streams that convey natural runoff. The portion of the Proposed Project alignment between Chestnut Avenue and Lawndale Avenue lies parallel to Colma Creek and is potentially in a FEMA designated floodplain.

The Crystal Springs Dam has been identified by the California Department of Water Resources Division of Dam Safety as subject to potential failure, with potential for substantial flooding in the canyon downstream of the dam, and seismic improvements are planned by the SFPUC. A dam-breach floodplain has been delineated for the San Mateo Creek canyon.

Groundwater

Groundwater throughout the project area is generally found at depths greater than 20 feet below ground surface. However, occasional undefined and discontinuous shallow-perched water zones, including those adjacent to local recharge sources (surface-waterbodies) or springs, have been encountered at shallower depths within the project area.

Figure D.7-1a. Watercourse Crossings on USGS Quadrangle
For security reasons this figure is not included in the online version of the report.

Figure D.7-1b. Watercourse Crossings on USGS Quadrangle
For security reasons this figure is not included in the online version of the report.

Figure D.7-1c. Watercourse Crossings on USGS Quadrangle
For security reasons this figure is not included in the online version of the report.

Figure D.7-1d. Watercourse Crossings on USGS Quadrangle
For security reasons this figure is not included in the online version of the report.

The Visitacion Valley Groundwater Basin encompasses approximately 800 acres in the City and County of San Francisco and 4,300 acres in San Mateo County. This basin underlies the underground segment of the Proposed Project, north of San Bruno. Bedrock is exposed at the land surface in numerous areas. Much of the remaining land surface is created by an artificial-fill deposition on Bay Mud. Unconsolidated sediment thicknesses range from 0 to 200 feet. Groundwater in the Visitacion Valley Basin is currently used for industrial and commercial purposes; however, potential beneficial uses include municipal, domestic, and agricultural water supply (PG&E, 2002).

Visitacion Valley Basin recharge is approximately 5,900 acre-ft. per year (Phillips, 1993). Approximately 1,000 acre-ft. per year of recharge results from rainfall, with the remainder from leakage from sewer and water pipes. Recharge from rainfall is restricted by ground cover due to the high density of development.

The Westside Groundwater Basin underlies a portion of the proposed overhead portion of the project from approximately San Bruno to Burlingame. The Westside Groundwater Basin is comprised of three unconsolidated, water-bearing units: the Merced Formation, the Colma Formation, and the locally occurring dune sands. The Merced and Colma Formations primarily comprise fine- to medium-grained sands that interfinger with intervals of discontinuous silt and silty sand. The total thickness of the three unconsolidated units is up to 500 feet thick in the Golden Gate Park, up to 700 feet thick near the San Francisco International Airport, and up to 3,700 feet thick in the area southeast of Thornton Beach. Near the airport, and in the vicinity of the project, groundwater flows easterly toward the San Francisco Bay.

Westside Basin groundwater recharge occurs as a result of infiltration and subsurface inflow. Infiltration sources include precipitation, seepage from surface waterbodies (creeks and lakes), irrigation return-flow, and leakage from underground pipes. Groundwater in the basin supplies numerous municipal wells for irrigation, industrial, and potable uses. Forty percent of San Bruno's water supply is derived from wells (City of San Bruno, 1984). South San Francisco obtains slightly over three percent of its water supply from groundwater pumps. Colma also uses a combination of groundwater and purchased water sources.

Aside from possible local perched groundwater associated with local streams, springs, or reservoirs, the south end of the project area, from approximately Hillsborough to the Jefferson Substation, has no groundwater beneath it. The San Mateo Plain Groundwater Basin is located to the east of this portion of the project area. This basin covers approximately 40 square miles and is approximately 1.5 miles from the project at the closest point.

Water Quality

The water in the Crystal Springs Reservoir and San Andreas Lake is mostly Hetch Hetchy water (transported form Hetch Hetchy Reservoir by pipelines), and generally meets water quality standards. Levels of turbidity, giardia, and cryptosporidium are typically low. Natural decomposition of organic matter typically results in oxygen-depleted conditions in the lower depths of Lower Crystal Springs Reservoir during the late summer. This results in increased color levels and elevated iron and manganese concentrations (San Francisco Planning Department, 2000).

The Peninsula Watershed Management Plan identified Water Quality Vulnerability Zones (WQV zones) within the Peninsula Watershed. The WQV zones are areas where activities or disturbance would have the greatest potential to affect the water quality of surface runoff and water stored in the reservoirs. Vulnerability is classified as high, moderate, or low based on the proximity of the area to water, rainfall intensity, wildlife concentration, vegetation as a protective layer, slope, and soil. Disturbance to areas of the highest vulnerability would result in the greatest risk to water quality (San Francisco

Planning Department, 2000). The majority of the proposed transmission line route from the Jefferson Substation to San Bruno is within WQV zones classified as moderate to high vulnerability. In general along the transmission line route, the high vulnerability zones are along and adjacent to stream channels. The ridges and watershed slopes are classified as moderate vulnerability.

The Federal Clean Water Act mandates the State to establish a list of the waterbodies not meeting water quality standards. This list is referred to as the 303(d) list after Section 303(d) of the Clean Water Act. The State must develop Total Maximum Daily Loads (TMDLs) for each waterbody listed. TMDLs examine the water quality problems, identify sources of pollutants, and specify actions that create solutions. The California Regional Water Quality Control Board (RWQCB) has identified three waterbodies in the vicinity of the proposed route that are on the 303 (d) list. These waterbodies, along with the pollutants of concern, are listed in Table D.7-1.

Table D.7-1. 303 (d) Listed Waterbodies in the Project Vicinity

Waterbody	Pollutant
South San Francisco Bay	Mercury, exotic species, copper, nickel, PCBs, Chlordane, DDT, Dieldrin, Furans, Dioxin
San Francisco Bay Urban Creeks	Diazinon
Guadalupe River Watershed	Mercury

Source: RWQCB, 2003.

Groundwater quality varies throughout the South Bay Basins, but is generally of very high quality, particularly in deeper aquifer systems. In contrast, there is significant and widespread pollution of the shallow aquifers from a variety of sources, including leaking fuel and solvents from tanks (underground and aboveground), historic drycleaner facilities, leaking sewer lines, agricultural fertilizers, and leaching at landfills. Cleanups at these sites are regulated by six different agencies. Investigations are complete, and cleanup is underway at the majority of regulated sites. A wide range of pollutants and/or polluting activities has the potential to degrade water quality in the South Bay Basins, with the major chemical threats being MTBE, solvents, nitrates, and salinity (via saltwater intrusion) (RWQCB, 2003).

Leaking underground storage tanks (LUSTs) and the associated release of MTBE leaching account for the largest number of groundwater pollution sites in the South Bay. As of September 2001, there were 947 open LUST sites and 2,109 closed LUST sites in the South Bay Basins. Groundwater contaminants from these LUSTs have had minimal effects on municipal and domestic wells in the South Bay Basins. To date, only one well has been impacted by MTBE (RWQCB, 2003).

Monitoring well data indicates that concentrations of total dissolved solids (TDS), chloride, and nitrate in the Visitacion Valley Groundwater Basin meet the primary or secondary drinking water standards (CCSF, 1996). Water quality in the Westside Basin is generally considered good. Most groundwater samples taken from around the southern basin in San Mateo County meet primary and secondary standards for TDS, chloride, and nitrate. Samples taken from around Colma Creek indicate elevated levels of TDS and nitrates (greater than 500 mg/l and 45 mg/l, respectively) (CCSF, 1996). Approximately 83 sites with soil and/or groundwater contamination were identified along or near the project alignment as having the potential to affect public and construction-worker health and safety (see additional information in Section D.8, Public Health and Safety). A number of the sites identified with known groundwater contamination are associated with leaking underground storage tanks from gasoline service stations. Consequently, groundwater in the vicinity of these sites potentially contains varying amounts of various petroleum hydrocarbons (e.g., gasoline and diesel) and fuel additives such as MTBE. The groundwater at some of these sites may also be affected by solvents, tanning sludge, isopropyl alcohol, mercury compounds, and/or sulfuric acid.

D.7.1.1 Jefferson Substation to Ralston Substation

This segment of the project is characterized by relatively natural watersheds on hilly terrain. There are 10 unnamed stream crossings in this segment, all draining to the Upper Crystal Springs Reservoir (as illustrated in Figure D.7-1a). The watersheds are small and are generally less than about 400 acres in area. Streams are steep and narrow from the hilly terrain, and generally in natural condition. Aside from possible localized, undefined, sub-surface water along streams or near springs, there is no groundwater below this segment. This segment is within the Peninsula Watershed and in moderate to high-risk WQV zones. The high-risk zones are along the stream channels. All other areas are classified as moderate risk.

D.7.1.2 Ralston Substation to Carolands Substation

This segment is characterized by relatively natural watersheds on hilly terrain. There are two proposed route stream crossings in this segment (Crossing Nos. 11 and 12 on Figure D.7-1b). Crossing No. 11, San Mateo Creek, is subject to a substantial flooding potential by the potential breach of the Crystal Springs Dam. Crossing No. 12 is a minor canyon draining into San Mateo Creek, which drains to San Francisco Bay. The remainder of this segment is along the ridgeline of the Peninsula Watershed in moderate risk WQV zones. Aside from possible localized, undefined, sub-surface water, there is no groundwater below this segment.

D.7.1.3 Carolands Substation to Transition Station

This segment is characterized by relatively natural watersheds on hilly terrain. The project would cross one small, local creek in this segment (Crossing No. 13 on Figure D.7-1b). This creek drains into the peninsula watershed. Most of this power line segment is within the Peninsula Watershed in an area draining to San Andreas Lake. WQV zones are moderate to high risk. The high risk zones are so designated due to their close proximity to San Andreas Lake in the vicinity of MP 12 to 14. Most of this segment is within the Westside Groundwater Basin, described in "General Setting" above.

D.7.1.4 Underground Segment

This segment of the Proposed Project is characterized by city streets. The terrain is naturally hilly, but has been modified by urban development. The Proposed Project would cross watercourses in 11 places in this reach (designated as Crossing Nos. 14 to 24 on Figures D.7-3 and D.7-4). Crossing Nos. 14 to 18 are urban streams substantially modified by channelization. The largest stream crossed is Colma Creek, which would be crossed three times (Crossing Nos. 16, 17, and 18 in Figure D.7-1c), Crossing No. 15 is 12-Mile Creek.

Crossing Nos. 19 to 24 (Figure D.7-1d) are in a relatively natural condition in the San Bruno Mountain State and County Park. All of these are small streams fed by small watersheds. Three of these, Crossing Nos. 22, 23 and 24, drain into the Guadalupe Canyon watershed. The Guadalupe watershed has a designated TMDL for mercury.

This segment is entirely within the Westside and Visitacion Groundwater Basins described in "General Setting" above. Perched groundwater in the vicinity of the BART right-of-way at the Proposed Project alignment has been encountered at a depth of five feet below grade during subsurface investigations for other projects in that area (PG&E, 2002).

D.7.2 Applicable Regulations, Plans, and Standards

Federal

Clean Water Act. The Clean Water Act (CWA) (33 U.S.C. Section 1251 et seq., formerly the Federal Water Pollution Control Act of 1972 was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. 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 water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Boards (RWQCB).

Section 401 of the CWA requires that any activity, including river or stream crossings during road, pipeline, or transmission line construction, which may result in a discharge into a State waterbody must be certified by the RWQCB. This certification ensures that the proposed activity does not violate State and/or federal water quality standards.

Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (ACOE) to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. The ACOE issues individual site-specific or general (Nationwide) permits for such discharges.

State

Streambed Alteration Agreement. Section 1601 of the California Fish and Game Code requires an agreement between the Department of Fish and Game and a public agency proposing to substantially divert or obstruct the natural flow or effect changes to the bed, channel, or bank of any river, stream, or lake. The agreement is designed to protect the fish and wildlife values of a river, lake, or stream.

Porter Cologne Water Quality Control Act. The Porter Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect State waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. The criteria for the project area are contained in the San Francisco Bay Region Water Quality Control Plan. Section 1601 of the California Fish and Game Code requires an agreement between the Department of Fish and Game and a public agency proposing to substantially divert or obstruct the natural flow or effect changes to the bed, channel, or bank of any river, stream, or lake. The agreement is designed to protect the fish and wildlife values of a river, lake, or stream.

Regional and Local

Peninsula Watershed Management Plan. The Peninsula Watershed Management Plan is administered by the San Francisco Public Utilities Commission (SFPUC) for the 23,000-acre Peninsula Watershed located in central San Mateo County. The purpose of the Management Plan is to provide a policy framework for the SFPUC to make consistent decisions about the activities, practices, and procedures that are appropriate on the Watershed lands. The primary goal of the Watershed Plan is to maintain and improve source water quality to protect public health and safety. The Watershed Plan includes a wide range of policies intended to protect the watershed resource and reduce or prevent adverse impacts to water quality. New construction within the watershed would be subject to review by the SFPUC for compliance with the Watershed Plan (San Francisco Planning Department, 2000).

Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin. The Basin Plan for the San Francisco Bay Basin is administered by the State Water Resources Control Board. The Basin Plan is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the San Francisco Bay region. The plan includes provisions for toxic pollutant management, industrial and construction activities, and erosion and sediment control (RWQCB, 2003).

San Mateo County Stormwater Pollution Prevention Program (STOPPP). The STOPPP program is part of the NPDES permit issued to the County of San Mateo and associated incorporated cities. The program includes best management practices for a variety of activities including concrete and mortar application, earth moving, general construction, operation of heavy equipment, and roadwork and paving. Coverage under the permit is obtained by filing a Notice of Intent (NOI) with the SWRCB (San Mateo County, 2003).

D.7.3 Environmental Impacts and Mitigation Measures for the Proposed Project

D.7.3.1 Significance Criteria

The following significance criteria are based on CEQA Checklist identified in Appendix G to the CEQA guidelines. Water resources impacts would be considered significant if the project:

- Violates any water quality standards or waste discharge requirements.
- Substantially depletes groundwater supplies or interferes substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Substantially alters 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 of siltation on- or off-site.
- Substantially alters 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 which would result in flooding on- or off-site.
- Creates or contributes runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrades water quality.
- Places within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Exposes 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.
- Results in or is subject to inundation by seiche, tsunami, or mudflow.

D.7.3.2 Applicant Proposed Measures

Table D.7-2 presents the Applicant Proposed Measures (APMs) designed by PG&E's to reduce impacts to hydrology and water quality. These APMs were presented by PG&E and will be monitored during project construction. Additional mitigation is also recommended in Section D.7.3.3 below.

Table D.7-2. Applicant Proposed Measures – Hydrology and Water Quality

APM	Description
APM 9.1: Implementation of Erosion Control and Sediment Transport Plan	An erosion control and sediment transport control plan will be prepared in association with the SWPPP and the revegetation plan. This plan will be prepared in accordance with RWQCB guidelines and other applicable BMPs. Implementation of the plan will help stabilize graded areas and waterways, and reduce erosion and sedimentation. The plan will designate BMPs that will be followed during construction activities. Erosion-minimizing efforts may include measures such as avoiding excessive disturbance of steep slopes; using drainage control structures (e.g., coir rolls or silt fences) to direct surface runoff away from disturbed areas; strictly controlling vehicular traffic; implementing a dust-control program during construction; restricting access to sensitive areas; using vehicle mats in wet areas; and revegetating disturbed areas following construction. Erosion-control measures will be installed before extensive clearing and grading begins, and before the onset of winter rains. Concrete washout stations will be established to avoid direct release to surface water or to areas where groundwater could become contaminated. In areas where soils are to be temporarily stockpiled, soils will be placed in a controlled area and managed with similar erosion-control techniques. In the case of hand-dug foundations, excavated soils will be collected in bins or drums to be lifted out by helicopter or used as part of the Revegetation Plan (refer to Chapter 6 of the PEA, Biological Resources). Where construction activities occur near a surface waterbody or drainage channel, stockpiles will be placed at least 100 feet from the waterbody or properly contained (such as bermed or covered to minimize risk of sediment transport to the drainage). Mulching, seeding, or other suitable stabilization measures will be used to protect exposed areas during and after construction activities. Revegetation plans, the design and location of retention/settlement ponds, and grading plans will be submitted to the CDFG and COE for review if construction requires a Streambed Alteration Agreement or Section 404 Permit, respectively. The Stormwater Pollution Prevention Plan (SWPPP) will be designed specifically for the hydrologic setting of the proposed Project, which includes water-supply reservoirs, upland slopes, and intermittent and seasonal streams. BMPs documented in the Erosion Control and Sediment Transport Plan will also be included in the SWPPP. As previously noted, the staging of construction materials, equipment, and excavation spoils will be performed at least 100 feet outside of drainage channels, intermittent streams, and reservoirs, where these receive overland runoff. This measure would not be required where runoff is already directed away from the channels, such as at Colma Creek where the channel lip is constructed above grade or where other protection measures such as berming and/or covering of stockpiles is performed. The SWPPP will identify such special circumstances. Trench spoils from the underground transmission line may be stockpiled and used to backfill the trench, and, upon completion of construction activities, the area will be graded to match the surroundings. In general, as described in Chapter 2 of the PEA, Project Description soils under the streets and in the BART ROW are unlikely to meet the specific backfill requirements and will be hauled offsite immediately after excavation. Open portions of the trench will be covered when not under active construction. Temporary stockpiles of excavated soil will be collected and placed in a controlled area and managed with erosion control techniques as noted in the Project's Erosion Control and Sediment Transport Plan and SWPPP. Standard erosion and dust-control practices will be used during construction according to BMPs to protect biological and hydrological resources. Surplus soils will be transported from the site and appropriately disposed.
APM 9.2: Environmental Training and Monitoring Program	An environmental training program will be established to communicate environmental concerns and appropriate work practices, including spill prevention and response measures and proper BMP implementation, to all field personnel. The training program will emphasize site-specific physical conditions to improve hazard prevention (e.g., identification of flow paths to nearest waterbodies) and will include a review of all site-specific plans, including but not limited to the Project's SWPPP, Erosion Control and Sediment Transport Plan, Health and Safety Plan, and Hazardous Substances Control and Emergency Response Plan. A monitoring program will also be implemented to ensure that the plans are followed throughout the construction period. BMPs, as identified in the Project SWPPP and Erosion Control and Sediment Transport Plan, will also be implemented during the Project to minimize the risk of an accidental release and provide the necessary information for emergency response.

Table D.7-2. Applicant Proposed Measures – Hydrology and Water Quality

APM	Description
APM 9.3: Hazardous Substance Control and Emergency Response Plan	PG&E will prepare a Hazardous Substance Control and Emergency Response Plan that will include preparations for quick and safe cleanup of accidental spills. This plan will be submitted with the grading-permit application. It will prescribe hazardous-materials handling procedures to reduce the potential for a spill during construction, and will include an emergency response program to ensure quick and safe cleanup of accidental spills. The plan will identify areas where refueling and vehicle-maintenance activities and storage of hazardous materials, if any, will be permitted. These directions and requirements will also be reiterated in the Project SWPPP.
APM 9.4: Emergency Spill Supplies and Equipment	Oil-absorbent material, tarps, and storage drums will be used to contain and control any minor releases of transformer oil. In the event that excess water and liquid concrete escapes from tower foundations 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
APM 9.5: Soil Sampling/Waste and Groundwater Characterization	Soil sampling and potholing will be conducted 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 at tower locations and along the underground transmission-line routes, soil borings will be advanced to identify areas where contaminated groundwater may be contacted. The location, distribution, or frequency of such tests will give adequate representation of the conditions in the construction area. If suspected contaminated groundwater is encountered in the depths of the proposed construction areas, 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 cities' stormwater drainage systems (with prior approval) or contained, tested, and disposed of by methods described above.
APM 9.6: Spill Prevention, Countermeasure, and Control Plans	PG&E will prepare or modify existing Spill Prevention, Countermeasure, and Control (SPCC) plans for the proposed transition station and substations as required by applicable regulations. The plan will include engineered and operational methods for preventing, containing, and controlling potential releases (e.g., construction of retention pond, moats, or berms), and provisions for quick and safe cleanup. The plan will be submitted to the appropriate agency for review. Existing SPCC plans for the substations mentioned above will be revised to include new equipment. Incorporation of SPCC measures in the Project design will reduce impacts to less than significant levels. (Also see Chapter 11 of the PEA, Hazards, Hazardous Materials, and Public Health.)

D.7.3.3 230 kV/60 kV Overhead Transmission Line

Jefferson Substation to Ralston Substation

Impact H-1: Soil Erosion and Sedimentation from Construction Activity and Access Roads

Disturbance of soil during construction could result in soil erosion and lowered water quality through increased turbidity and sediment deposition into local streams, the Peninsula Watershed, San Francisco Bay, and other waterbodies located downstream of the project site.

Construction of the overhead transmission lines would require excavation and grading for roads and towers. Removal of vegetation, soil disturbance and stockpiling of earth during construction, and construction of culverts in ephemeral watercourses could accelerate soil erosion which would lead to sediments being washed into the Crystal Springs Reservoirs and San Andreas Lake and tributary streams, as well as (to a much lesser extent) into San Francisco Bay. Because most of the overhead transmission line would be located in moderate to high WQV zones within the Peninsula Watershed, this impact is considered potentially significant.

APM 9.1 is intended to reduce the erosion and sedimentation from construction. This measure requires development and implementation of an Erosion Control and Sediment Transport Plan, a Stormwater Pollution Prevention Plan (SWPPP) and a Revegetation Plan in accordance with RWQCB guidelines. The requirements of APM 9.1 have been reviewed and are considered to adequately protect water quality. However, because overhead construction would occur nearly entirely on SFPUC Watershed Lands, it is important that the SFPUC review and approve the specific proposed provisions. Mitigation Measure H-1a is also recommended to strengthen the intent of APM 9.1 by ensuring compliance with the Peninsula Watershed Management Plan, thereby reducing Impact H-1 to less than significant (Class II).

Mitigation Measure for Impact H-1

H-1a Erosion and Sedimentation Control. The Erosion Control and Sediment Transport Plan, Stormwater Pollution Prevention Plan, and Revegetation Plan required by APM 9.1 shall be reviewed and approved by the San Francisco Public Utilities Commission for those portions of the project within the Peninsula Watershed, for compliance with the Peninsula Watershed Plan prior to initiation of construction. Verification of SFPUC approval shall be provided to the CPUC at least 60 days before construction.

Impact H-2: Degradation of Surface or Ground Water Quality Through Spill of Potentially Harmful Materials Used In Construction

Accidental spills of potentially harmful materials used during construction could wash into and pollute surface waters or groundwater. Materials that could potentially spill or leak include diesel fuel, gasoline, lubrication oil, hydraulic fluid, antifreeze, transmission fluid, lubricating grease, and other fluids. The waters of Crystal Springs Reservoirs and San Andreas Lake, as well as local tributary streams and San Francisco Bay, could be the receiving waters of these materials should a spill occur.

APMs 9.2 and 9.3 are intended to reduce this impact. These measures require implementation of an environmental training and monitoring program and a hazardous substance control and emergency response plan. Mitigation Measure H-2a is also recommended to strengthen the intent of APMs 9.2 and 9.3 by ensuring protection of the Peninsula Watershed thereby reducing Impact H-2 to less than significant (Class II).

Mitigation Measure for Impact H-2

H-2a Hazardous Substance Control. The environmental training and monitoring program and hazardous substance control and emergency response plan required by APMs 9.2 and 9.3 shall be reviewed and approved by the San Francisco Public Utilities Commission for those portions of the project within the Peninsula Watershed prior to initiation of construction. Verification of SFPUC approval shall be provided to the CPUC at least 60 days prior to construction.

Impact H-3: Increased Runoff from New Impervious Areas

Construction of substations, transfer stations, tower foundations, access roads, and pull site/laydown areas could result in additional runoff through creation of impervious areas and compaction of soils. Impervious areas and compacted soils generally have higher runoff coefficients than natural areas, and increased flood peaks are a common occurrence in developed areas. The effect of creating compacted areas (e.g., in access roads) would be less than the effect of installing concrete or asphalt. In the case of the proposed overhead line, there may be small local increases in runoff by this process, but the total area affected would be very small in comparison to the total watershed. PG&E estimates that the total impervious

area from all tower foundations would be about 700 square feet over a distance of 14 miles. By comparison, the Peninsula Watershed is 23,000 acres in size. This impact would be adverse, but not significant (Class III). No mitigation is required.

Impact H-4: Encroachment Into a Floodplain or Watercourse by Permanent Above-ground Project Features

Encroachment of a project structure into a flow path could result in flooding of or erosion damage to the encroaching structure, diversion of flows and increased flood risk for adjacent property, or increased erosion on adjacent property. Impact H-4 is likely to occur only if power poles or other permanent project features were constructed in a watercourse. Mitigation Measure H-4a is recommended to ensure such construction does not occur without adequate protection to prevent flooding and erosion. Implementation of this mitigation measure would reduce this potentially significant impact to less than significant levels (Class II).

Mitigation Measure for Impact H-4

H-4a **Flood Damage Prevention**. Aboveground project features such as power poles, substations, and transfer stations shall be placed outside the flow path of watercourses unless an engineering analysis, reviewed and approved by the California Public Utilities Commission and San Francisco Public Utilities Commission (for areas within the Peninsula Watershed), demonstrates that watercourse avoidance is not practicable, and that appropriate measures, such as installation of bank protection or raising foundations above flood levels, have been taken to identify and prevent potential flooding and erosion hazards. PG&E shall document to the CPUC at least 60 days before the start of construction which structures, if any, would be in flow paths and what protective measures are proposed.

Ralston Substation to Carolands Substation

Impacts and mitigation measures for this segment are the same as those for the Jefferson Substation to Ralston Substation segment (see Impacts H-1 through H-4 above). In addition, Impact H-5 (see below) is applicable to the Ralston Substation to Carolands Substation segment.

Impact H-5: Construction in a Potential Dam Inundation Area

The Proposed Project would cross San Mateo Creek approximately 0.25 miles downstream of the Crystal Springs Dam, which has the potential for failure. Dam failure would result in a dam-inundation floodplain crossing the project path. The crossing of the dam inundation area would be by spanned with transmission towers on either side of the canyon at elevations above the elevation of the dam. The tower foundations and conductors would be well above the dam inundation area. This impact is less than significant and no mitigation is required (Class III).

Carolands Substation to Transition Station

Impacts and mitigation measures for this segment are the same as those for the Jefferson Substation to Ralston Substation segment (see Impacts H-1 to H-4 above). However, it should be noted that although this segment would include nine fewer stream crossings than for the Jefferson Substation to Ralston Substation segment, the alignment would be much closer to San Andreas Lake.

This segment is above the Westside Groundwater Basin. Excavation for the power pole foundations would be required which could reach groundwater depending on groundwater depth. Excavation for power poles would be from 15 to 40 feet in depth. In addition to the impacts identified under the Jefferson Substation to Ralston Substation segment, Impact H-6 and Mitigation Measures H-2a and HAZ-3a (see below) are applicable to this segment.

Impact H-6: Water Quality Degradation Through Project-Related Excavation

Contaminated soil or groundwater in the path of the project could be disturbed by excavation, resulting in a potential transfer of the contamination to surface waters. The excavated area, if linear such as for the proposed underground facilities, could act as a conduit to extend groundwater contamination to new areas. Spills of hazardous materials in excavated areas during construction could introduce contaminants to groundwater. (Note that contaminated soils are addressed in Section D.8.)

The groundwater beneath this area of the watershed, being in the Peninsula Watershed, is unlikely to be contaminated because there has not been industrial activity in the area. APMs 9.2 through APM 9.6 (see Table D.7-2) and APMs 11.4 and 11.5 (see Table D.8-5) would reduce are intended to mitigate this impact through spill prevention, spill cleanup, soil and groundwater sampling, excavation of hazardous materials, proper disposal of hazardous materials, and characterization of waste. In addition, Mitigation Measures H-2a (see above) and HAZ-3a (measures for evaluation of contaminated groundwater or soils; see Public Health and Safety, Section D.8.3.3) are also recommended to ensure proper detection, prevention, and control of contaminated groundwater, and appropriate countermeasures for spills. This is a potentially significant impact (Class II), mitigable to less than significant levels with implementation of Mitigation Measures H-2a and HAZ-3a.

Mitigation Measure for Impact H-6

Mitigation Measures H-2a (see above) and HAZ-3a (see Section D.8.3.3) would reduce this potentially significant impact to less than significant levels.

D.7.3.4 Transition Station

The proposed transition station would be located on a high area and would not be subject to flow from a watercourse. Impacts H-1 (erosion) and H-6 (existing contamination) would apply. Mitigation Measure H-1a (see Section D.7.3.3) are recommended to mitigate Impact H-1 and Mitigation Measures H-2a and HAZ-3aare recommended to mitigate Impact H-6 to levels that are less than significant (Class II).

Impact H-3, increased runoff from added impervious surfaces, would also occur. Although the impervious area of the proposed transition station would create some additional local runoff, the station would be surrounded by a berm that would contain runoff, which would mitigate the effect of imperviousness. Further, the area of the proposed transition station is small and so not likely to have a noticeable effect on flood peaks downstream. Impact H-3 would be less than significant (Class III) and mitigation would not be required.

Impact H-7: Water Quality Degradation Caused by Accidental Releases of Oil from Substations or Transition Station

Oil from new electrical equipment at the Jefferson, Watershed, Ralston, Hillsdale Junction, Crystal Springs, and Martin Substations or the transition station could be released accidentally and contaminate local surface water or groundwater. The oil in the electrical equipment would be mineral oil and non-toxic. Nevertheless,

release of this oil to surface water or groundwater would be considered water contamination. APMs 9.4 and 9.6 are intended to reduce this impact through the use of emergency equipment and development of spill prevention, countermeasure, and control plans. With implementation of APMs 9.4 and 9.6, Impact H-7 is classified as less than significant (Class III) and mitigation measures are not required.

D.7.3.5 230 kV Underground Transmission Line

Impacts H-1 (erosion), H-2 (construction contamination), and H-6 (existing groundwater or soil contamination) described in Section D.7.3.3 would apply to the proposed underground transmission line. Impact H-1 would be mitigated to less than significant levels (Class II) with implementation of Mitigation Measure H-1a (erosion and sedimentation control); Impact H-2 would be mitigated to less than significant levels (Class II) with implementation of Mitigation Measure H-2a (hazardous substance control), and Impact H-6 would be mitigated to less than significant levels (Class II) with implementation of Mitigation Measures H-2a and HAZ-3a. In addition, Impacts H-8 and H-9 have been identified for this project segment, as described below.

Impact H-8: Exposure of the Underground Cable to Damage Through Stream Scour and Erosion

Segments of the underground cable placed below natural-bed streams, or adjacent to natural-bank streams could be exposed through scour[1] or bank erosion. Exposure of the duct bank and cable could lead to power outages or shock hazard. This impact is unlikely to occur because most streams that would be crossed are lined to prevent erosion and scour. However, at least one crossing of Colma Creek could be subject to scour. Mitigation Measure H-8a is recommended to ensure proper burial at stream crossings. Impact H-8 would be less than significant with implementation of Mitigation Measure H-8a (Class II).

Mitigation Measure for Impact H-8

H-8a Scour and Erosion. At locations where the proposed underground transmission line would cross below or pass adjacent to streams with erodible beds or banks, the burial depth shall be extended below the estimated 100-year depth of scour for that stream, or located at a sufficient distance from the bank as to avoid erosion that can reasonably be expected to occur during the life of the project. Proposed burial depths shall be submitted to the CPUC for review and approval at least 60 days before construction.

Impact H-9: Interruption of Groundwater Flow or Modification of Groundwater Depths During Construction of Underground Transmission Line

Excavation and dewatering for construction of the underground transmission line in areas of shallow groundwater could have local effects on groundwater flow and levels. The underground portions of the project would mostly be beneath existing streets and in the BART right-of-way. The trench to be constructed for the underground line would be narrow and typically 6 to 8 feet deep. Excavation at this depth is unlikely to adversely affect groundwater because groundwater is generally 30 feet or more below the surface in the project area, although the exact depth of the water table along the underground route is unknown in most locations.

[1] Scour is the removal of sediment (soil and rocks) from streambeds and stream banks caused by moving water.

APM 9.5 calls for characterization of groundwater that is encountered during construction. However, the acquiring of information regarding the depth and location of groundwater is not specified as part of this APM. Mitigation Measure H-9a is required, in addition to APM 9.5, to reduce this potentially significant impact on groundwater hydrology to less than significant levels (Class II).

Mitigation Measure for Impact H-9

H-9a **Construction Effects on Groundwater.** Groundwater levels along the underground transmission line route shall be tested by drilling pilot borings. The location, distribution, or frequency of such tests shall be determined to give adequate representation of the conditions along the underground line. Locations where groundwater depth is less than 8 feet deep shall be identified prior to trenching activities. PG&E shall document results of test drilling in a letter report to the CPUC at least 30 days before construction starts and shall propose specific means to minimize the impact on groundwater if shallow groundwater is found that does not flow parallel to the orientation of the underground line, such as a creating a shallower trench or creating the duct bank in the shallow groundwater area that is somewhat porous and would allow groundwater to flow through the bank to some degree. These measures must be approved by the CPUC prior to the start of construction of the underground segment.

D.7.3.6 Substations, Switchyards, and Taps

Impacts associated with substations, switchyards, and taps are the same as described for the transition station (Section D.7.3.4). With the exception of those located within the Peninsula Watershed, mitigation and impact classification are also the same. Impacts H-1 (erosion) and H-6 (existing contamination) would apply. Mitigation Measure H-1a (erosion control) is recommended to mitigate Impact H-1 and Mitigation Measures H-2a and HAZ-3a are recommended to reduce impacts from hazardous substance releases or discovery (Impact H-6) to levels that are less than significant (Class II). Increased runoff from added impervious surfaces (Impact H-3) would also occur (Class III); mitigation would not be required. However, Impact H-7 (described in Section D.7.3.4 for the proposed transition station and addressing water quality degradation caused by accidental releases of oil from substations or transition station) could also occur here occur at these locations and while APM 9.6 provides adequate protection, it does not require review by the SFPUC. To strengthen the intent of APM 9.6 and to reduce impacts to less than significant levels (Class II), Mitigation Measure H-7a is proposed for substations, switchyards, and taps within the Peninsula Watershed.

Mitigation Measure for Impact H-7

H-7a **Operational Oil Releases.** PG&E shall submit the Spill Prevention, Countermeasure, and Control Plan described in APM 9.6 (Spill Prevention) to the CPUC for review and approval, and to the San Francisco Public Utilities Commission for substations, switchyards, and taps located within the Peninsula Watershed. PG&E shall document to the CPUC the SFPUC's approval of SPPCP at least 60 days before construction.

D.7.4 Southern Area Alternatives

D.7.4.1 PG&E Route Option 1B – Underground

Environmental Setting

The basic setting for this alternative from Jefferson Substation to Trousdale Drive is as described for the Proposed Project in Sections D.7.1.1, D.7.1.2, and D.7.1.3. This portion of the route is within the Peninsula Watershed and would cross Water Crossings 1-13, although since at most locations the route is closer to the Peninsula lakes than the Proposed Project, watershed areas would be slightly larger. Approximately the north two miles of this portion of the route is within the Westside Groundwater basins.

At this alternative's turn into Trousdale Drive, the alignment would leave the Peninsula Watershed and enter the urban environment of Burlingame, Millbrae and San Bruno. The route would be in the Trousdale Drive and El Camino Real rights-of-way to San Bruno Avenue. This urban portion of the alternative would cross three watercourses, as opposed to none for the corresponding segment of the Proposed Project. These three streams drain to San Francisco Bay. The entire urban portion of this alternative, from Trousdale Drive to San Bruno Avenue, is within the Westside Groundwater basins.

Environmental Impacts and Mitigation Measures

This entire alternative would be underground. The major impacts of concern would be those related to construction, because construction impacts are more intense from the trenching required for an underground line. Impact H-1 (erosion and sedimentation) would result because this alternative would involve approximately 15 miles of underground transmission line construction (trenching) within and adjacent to the Peninsula Watershed. However, since virtually all of the construction would be in road rights-of-way, disturbance to natural ground within the Peninsula Watershed would be slight. This impact would be mitigated to less than significant levels with implementation of Mitigation Measure H-1a (Class II). Impact H-2 (construction equipment contaminating surface or groundwater) would be similar to the Proposed Project, requiring implementation of Mitigation Measure H-2a. Impact H-9 (interruption of groundwater flow during construction of underground line) could occur in the area of route south of San Bruno Avenue because this portion of the route would be over the Westside Groundwater Basin. This impact would be reduced to less than significant levels with implementation of Mitigation Measure H-9a (Class II).

Substation impacts would be the same as those for the Proposed Project: Impact H-3 (increased runoff from new impervious surfaces) would be less than significant (Class III), Impact H-4 (permanent facilities in floodplains) would be prevented with Mitigation Measure H-4a, and Impact H-7 (water quality degradation from accidental releases at substations).

One operational impact could occur: Impact H-8 (stream scour exposing the underground cable) would not occur because all water crossings would occur in existing roadways and therefore they would be unlikely to be subject to scour. Mitigation Measure H-8a should still be implemented to ensure proper burial depth at stream crossings; with this mitigation measure, Impact H-8 would be less than significant (Class II).

Impact H-10: Degradation of Water Quality Due to the Use of Motorized Watercraft

As described in Section 4.2.1 of Appendix 1, one of the options to crossing the Crystal Springs Dam would be to use a 3,000-foot underwater cable to avoid direct impacts to Crystal Springs Dam. The submarine cable would be placed directly on the lake bottom utilizing motorized watercraft. The use of motorized watercraft

and associated fuels and lubricants could potentially degrade the water quality of the lake, a potentially significant (Class II) impact. However, implementation of Mitigation Measure H-10a, below, would ensure that water quality impacts from the use of motorized watercrafts on Crystal Springs Reservoir would be less than significant.

Mitigation Measure for Impact H-10

H-10a Contamination From Motorized Watercraft. Should the Underwater Cable Design Option be selected as part of the PG&E Route Option 1B – Underground Alternative, PG&E shall submit to the CPUC and the SFPUC for review and approval a plan for prevention of reservoir contamination, including the following provisions at a minimum:

- Motorized watercraft shall be steam-cleaned prior to entering the reservoir;
- Oil-absorbent booms will be onboard all watercraft at all times;
- Refueling of watercraft will occur out of the reservoir on dry land; and
- All watercraft with outboard engines would utilize four-stroke engines meeting the California Air Resources Board new emission standards for outboard engines manufactured after 2001.

Comparison to Proposed Project Segment

There are 27 total watercourses crossed by this alternative route, compared with 24 for the Proposed Project. This alternative, within the Peninsula Watershed, would be closer to the Peninsula Lakes than the Proposed Project in the Cañada Road and Skyline Boulevard segments, but since it would be installed beneath existing roads, there would be minimal disturbance to Peninsula Watershed natural areas. With proposed mitigation, all impacts would be less than significant, the same as for the Proposed Project.

D.7.4.2 Partial Underground Alternative

Environmental Setting

The setting for this alternative is basically as described for the Proposed Project in Section D.7.1. Watercourse Crossings 1 and 2 would be at lower elevations on the watershed than for the Proposed Project, and therefore at areas with potentially larger discharge and closer to the Peninsula Lakes. Otherwise, there is no difference from the setting for the Proposed Project.

Environmental Impacts and Mitigation Measures

This alternative would involve overhead and underground transmission line construction. The major impacts of concern would be those related to the underground construction, because these impacts are more intense than those of overhead line installation. Impact H-1 (erosion and sedimentation) would result because this alternative would involve approximately 3.5 miles of underground transmission line construction (trenching) in unpaved roads within the Peninsula Watershed. Due to the construction in unpaved roads and adjacent areas, construction would disturb natural ground within the Peninsula Watershed. This impact would be mitigated to less than significant levels with implementation of Mitigation Measure H-1a (Class II). In addition, the overhead portion of this alternative relocated to the west of I-280 would be much closer to Flume Creek so sedimentation in the creek could result if Mitigation Measure H-1a were not effectively implemented.

Impact H-2 (construction equipment contaminating surface or groundwater) would be slightly greater than for the Proposed Project because of the more intense construction activities required for trenching, requiring implementation of Mitigation Measure H-2a. Impact H-9 (interruption of groundwater flow during construction of underground line) is unlikely to occur because the underground construction area is not over a groundwater basin so Mitigation Measure H-9a would not be required.

Substation impacts would be the same as those for the Proposed Project: Impact H-3 (increased runoff from new impervious surfaces) would be less than significant (Class III), Impact H-4 (permanent facilities in floodplains) would be prevented with Mitigation Measure H-4a, and Impact H-7 (water quality degradation from accidental releases at substations).

No streams would be crossed in the underground segments, so Impact H-8 (stream scour exposing the underground cable) would not occur and Mitigation Measure H-8a would not be required.

Comparison to Proposed Project Segment

The Partial Underground Alternative would have two segments that are substantially different from the Proposed Project in terms of potential impacts to hydrology and water quality. First, construction of the two underground segments along unpaved portions of the Peninsula ridgeline (immediately south and north of San Mateo Creek) would result in greater potential for subsequent impacts from erosion and sedimentation (Impact H-1). This would result from trenching through unpaved areas, vehicle traffic along dirt roads, and storage of spoils piles. Construction in this area would also have a greater potential for construction spills to affect water quality (Impact H-2), due to the greater intensity of construction activity.

The second area where the Partial Underground Alternative would have greater impact potential than the Proposed Project is the where the route would be moved west of the I-280 freeway to minimize impacts to residences in Burlingame. This alternative route segment would be much nearer to Flume Creek and San Andreas Lake, and it would be constructed in an area where there are currently no transmission lines. Construction disturbance from vehicle access and tower construction activities would be greater than for the Proposed Project due to the proximity to waterways and minimal existing disturbance.

D.7.5 Northern Area Alternatives

D.7.5.1 West of Skyline Transition Station

Environmental Setting of the Alternative Transition Station

The West of Skyline Transition Station would be within the vegetated open space of the Peninsula Watershed, adjacent to the San Andreas Trail and west of Skyline Boulevard. There are no water crossings in the immediate vicinity of the site.

Environmental Impacts and Mitigation Measures for the Alternative Transition Station

This alternative transition station is in a location that could drain to San Andreas Lake within the Peninsula Watershed, with potential for erosion and sedimentation to contaminate the water in the lake (Impact H-1) if appropriate mitigation is not implemented. However, the transition station is relatively small, requiring grading and construction only over about 0.2 acres. This impact would be mitigated to less than significant levels with implementation of Mitigation Measure H-1a (Class II).

Impact H-2 (construction equipment contaminating surface or groundwater) would be greater than for the Proposed Project because this site has a greater likelihood of contaminating Peninsula Watershed lands and waterways, but implementation of Mitigation Measure H-2a would ensure that impacts are less than significant. Impact H-9 (interruption of groundwater flow during construction of underground line) is unlikely to occur because the underground construction area is not over a groundwater basin so Mitigation Measure H-9a would not be required.

Impacts at stations would be greater than those for the Proposed Project because of the proximity of this site to Watershed resources, but impacts would remain less than significant with implementation of mitigation measures. Impact H-3 (increased runoff from new impervious surfaces) would be less than significant (Class III) and Impact H-7 (water quality degradation from accidental releases at substations) would require implementation of Mitigation Measure H-7a.

No streams would be crossed near the site, so Impact H-8 (stream scour exposing the underground cable) would not occur and Mitigation Measure H-8a would not be required.

Comparison to Proposed Project Segment

All impacts associated with the West of Skyline Transition Station and the proposed transition station would be mitigated to less than significant levels, same as for the Proposed Project. However, unlike the Proposed Project, this alternative transition station would require construction on currently undisturbed land so construction impacts would be greater, and due to its location, it has the potential to drain to and contaminate San Andreas Lake and other Watershed resources.

West of Skyline Transition Station with Proposed Underground Route

Environmental Setting

The transition station setting is discussed immediately above; the connection to the proposed underground route would be within Skyline Boulevard and would cross no waterways.

Environmental Impacts and Mitigation Measures

Impacts of the transition station included with this alternative route are described above under Section D.7.5.1, West of Skyline Transition Station. Impacts of the short segment of underground transmission line from the alternative transition station to the connection with the proposed route would be the same as the remainder of the underground segment of the Proposed Project. Impact H-1 (erosion and sedimentation) would be slightly greater due to the addition of approximately 1,500 feet of trenching along the ridgeline of the Peninsula Watershed from the transition station to San Bruno Avenue. Overall, this impact would be mitigated to less than significant levels (Class II) with implementation of Mitigation Measure H-1a. Impact H-6 (degradation of water quality from construction) would also be slightly more severe because of the additional length of underground construction, requiring implementation of Mitigation Measures H-2a and HAZ-3a to ensure that impacts are less than significant (Class II).

Comparison to Proposed Project Segment

Aside from the transition station (described above), the only difference between this alternative underground route and the Proposed Project is the 1,500-foot trenched reach between the transition station and San Bruno Avenue. This trenching increases the potential for degradation of water quality. Further, the trenching

and associated transition station have the potential to drain to the San Andreas Reservoir, with potential water quality impacts to the reservoir.

West of Skyline Transition Station with Sneath Lane Underground Route

Environmental Setting

The environmental setting for this alternative is the same as the setting described in Section D.7.1 of this report with the addition of one water crossing (San Bruno Creek) on Sneath Lane. Sneath Lane runs more or less parallel with San Bruno Creek.

Environmental Impacts and Mitigation Measures

Impacts of the West of Skyline Transition Station are described in Section D.7.5.1. Impacts of the additional 3,500-foot segment of underground transmission line from the alternative transition station to the connection with the proposed route would be the same as the remainder of the underground segment of the Proposed Project. Impact H-1 (erosion and sedimentation) would be slightly greater due to the additional trenching along the ridgeline of the Peninsula Watershed from the transition station to Sneath Lane. Overall, this impact would be mitigated to less than significant levels (Class II) with implementation of Mitigation Measure H-1a. Impact H-6 (degradation of water quality from construction) would also be slightly more severe because of the additional length of underground construction. This impact would be less than significant with implementation of Mitigation Measure H-2a and HAZ-3a.

Impact H-8 (scour risk to underground cable) would occur at the San Bruno Creek crossing on Sneath Lane, but because the conduit would be within Sneath Lane, it is unlikely this crossing would be subject to scour. Mitigation Measure H-8a (to ensure proper burial at stream crossings; see Section D.7.3.5) would reduce this impact to less than significant levels (Class II).

Comparison to Proposed Project Segment

This alternative and the Proposed Project would require similar lengths of underground construction, except the Sneath Lane Underground segment would require an additional 3,500-foot trenched reach between the transition station and Sneath Lane and the added stream crossing on Sneath Lane (Impact H-8). The additional trenching, even though in Skyline Boulevard, slightly increases the potential for Impacts H-1 (erosion and sedimentation) and H-6 (degradation of water quality from construction) to occur.

West of Skyline Transition Station with Westborough Boulevard Underground Route

Environmental Setting

The environmental setting for this alternative is the same as described in Section D.7.1, but this route would continue north along the Skyline Boulevard to Westborough Boulevard and then turn down Westborough to the BART ROW. This would eliminate from the proposed route the San Bruno Avenue and a portion of the BART ROW. The modified route segment adds three new watercourse crossings and eliminates two (Crossings 14 and 15 in Figure D.7-1c are eliminated). Rather than turn away from the Peninsula Watershed at San Bruno Avenue, this alternative continues along the Peninsula ridgeline for approximately 2.1 miles, then drops eastward into watersheds draining into San Francisco Bay. The entire alternative route is above the Westside Groundwater Basin.

Environmental Impacts and Mitigation Measures

Impacts of the West of Skyline Transition Station are described in Section D.7.5.1. This underground route would require over 2 miles of additional construction along Skyline Boulevard (eliminating San Bruno Avenue and a portion of the BART ROW), but the overall length of underground construction would be similar to the proposed route. The underground segment along Skyline Boulevard would almost entirely be north of the Peninsula Watershed. Skyline Boulevard is developed along the west and east sides. As a result, Impact H-1 (erosion and sedimentation) would be similar to that of the proposed route; this impact would be mitigated to less than significant levels (Class II) with implementation of Mitigation Measure H-1a. Impact H-6 (degradation of water quality from construction) would also be slightly more severe because of the additional length of underground construction. This impact would be less than significant with implementation of Mitigation Measure H-2a.

This route segment would have three stream crossings but they would occur in roadways. Impact H-8 (scour risk to underground cable) has a small probability of occurring it is unlikely these crossing would be subject to scour. Mitigation Measure H-8a (to ensure proper burial at stream crossings) would reduce this impact to less than significant levels (Class II).

Comparison to Proposed Project Segment

The difference between this alternative and the Proposed Project is the two-mile trenched reach between the alternative transition station and Westborough Boulevard (not a substantially greater sedimentation risk than the Proposed Project due to Skyline Boulevard's development), and the additional stream crossing on the alternative route.

D.7.5.2 Sneath Lane Transition Station

Environmental Setting of the Alternative Transition Station

The Sneath Lane Transition Station would be in a suburban area on the ridge north of the Peninsula Watershed lands and west of Skyline Boulevard, in the City of San Bruno. The transition station would be placed on graded and graveled land adjacent to the Sneath Lane Substation. The station is within the Westside Groundwater Basin.

Environmental Impacts and Mitigation Measures for the Alternative Transition Station

The Sneath Lane Transition Station is located less than one mile due north of San Andreas Lake. While technically within the lake's drainage area, the distance of this site from the lake makes sedimentation impacts unlikely. Regardless, Mitigation Measure H-1a should be implemented to minimize erosion and sedimentation.

Impact H-2 (construction equipment contaminating surface or groundwater) would be similar to the Proposed Project because both sites are disturbed and have little likelihood of contamination affecting waterways. Implementation of Mitigation Measure H-2a would ensure that impacts are less than significant. Impact H-9 (interruption of groundwater flow during construction of underground line) is unlikely to occur because the underground construction area is not over a groundwater basin so Mitigation Measure H-9a would not be required.

Station impacts would be similar to those of the Proposed Project because both are on disturbed sites in developed areas. Impact H-3 (increased runoff from new impervious surfaces) would be less than

significant (Class III) and Impact H-7 (water quality degradation from accidental releases at substations) would require implementation of Mitigation Measure H-7a.

No streams would be crossed near the site, so Impact H-8 (stream scour exposing the underground cable) would not occur and Mitigation Measure H-8a would not be required.

Comparison to Proposed Project Segment

All impacts associated with the Sneath Lane Transition Station and the proposed transition station would be mitigated to less than significant levels. With respect to water resources impacts, the two sites are similar.

Sneath Lane Transition Station with Proposed Underground Route

Environmental Setting

The environmental setting for this underground route is the same as the Proposed Project because both include segments along or parallel to Skyline Boulevard between San Bruno Avenue and Sneath Lane.

Environmental Impacts and Mitigation Measures

Impacts of the Sneath Lane Transition Station are described under Section D.7.5.2. This underground route would require an additional approximately 3,500 feet of trenching back to San Bruno Avenue, slightly increasing the magnitude of construction impacts. This additional trenching would occur in the roadway, so there would be minimal potential for erosion or sedimentation into waterways. However, implementation of Mitigation Measure H-1a is recommended for all construction. Mitigation Measures for Impacts H-2 through H-9 would also apply to ensure that impacts are less than significant.

Comparison to Proposed Project Segment

The difference between this alternative and the Proposed Project is the additional 3,500-foot trenched reach between San Bruno Avenue and Sneath Lane. The extra trenching increases the severity of all construction impacts (Impacts H-1, H-6 and H-9), but impacts remain less than significant with mitigation applied.

Sneath Lane Transition Station with Sneath Lane Underground Route

Environmental Setting

The environmental setting for this alternative is similar to that of the proposed route, with the addition of one water crossing (San Bruno Creek) on Sneath Lane. Sneath Lane runs more or less parallel with San Bruno Creek.

Environmental Impacts and Mitigation Measures

Impacts of the transition station itself are described under Section D.7.5.2, Sneath Lane Transition Station. The impacts of the Sneath Lane underground route are described above for the West of Skyline Transition Station with Sneath Lane Underground Route, and would be essentially the same as the underground portion of the proposed route, since both would be within paved roadways and a paved segment of the BART ROW. Because the added stream crossing would occur within Sneath Lane, no direct impacts to the stream are expected to occur.

Comparison to Proposed Project Segment

In comparison with the Proposed Project, this alternative would have an added stream crossing on Sneath Lane. There would not be a substantial difference between the impacts of the two routes.

Sneath Lane Transition Station with Westborough Boulevard Underground Route

Environmental Setting

The environmental setting for this alternative includes an additional water crossing (San Bruno Creek) on Skyline Boulevard near Sneath Lane and two waterway crossings on Westborough Boulevard. Westborough Boulevard runs more or less parallel to an unnamed stream.

Environmental Impacts and Mitigation Measures

The general impacts and mitigation measures that would be applicable to the Sneath Lane Transition Station with the Westborough Boulevard Underground route would be the same as those for the underground segment of the proposed route. Impacts H-1 (erosion and sedimentation) and H-2 (construction contamination) would be prevented through implementation of Mitigation Measures H-1a and H-2a. No aboveground features would be within floodplains so Impact H-4 would not apply. Impact H-8 (exposure of cable due to scour) is unlikely to occur since waterway crossings would be within roadways, and Impact H-9 (interruption of groundwater flow) is also unlikely since there is no groundwater basin below much of this route.

Comparison to Proposed Project Segment

There are three stream crossings along this alternative where there are two stream crossings along the Proposed Project alignment. Other impacts would be similar to those of the Proposed Project's underground segment.

D.7.5.3 Cherry Avenue Alternative

Environmental Setting

The environmental setting for this alternative is the same as the setting described for the Proposed Project in Section D.7.1, although this route segment extends north of the proposed route. The alternative route segment along Cherry Avenue has no stream crossings, with none eliminated on the avoided portion of the proposed route. Groundwater conditions are the same as for the Proposed Project, over the Westside Groundwater Basin.

Environmental Impacts and Mitigation Measures

This short alternative would avoid the eastern segment of San Bruno Avenue and the southern end of the BART ROW, substituting Cherry Avenue and a portion of Sneath Lane. Construction in this segment would have the same impacts as those described for the underground segment of the Proposed Project in Section D.7.3.3. Standard construction mitigation measures (H-1a, H-2a) would reduce construction impacts to less than significant levels. No substations would be affected in this route segment, and no water crossings occur, so Impacts H-3, H-4, H-7, and H-8 would not apply. Mitigation Measure H-9a would ensure that groundwater flow would not be affected by construction.

Comparison to Proposed Project Segment

From a water resources standpoint, there is no difference in impacts between this alternative and the Proposed Project.

D.7.5.4 PG&E's Route Option 4B – East Market Street

Environmental Setting

The environmental setting for this alternative is the very similar to that of the Proposed Project segment that this segment would replace. The revised route at East Market Street has no stream crossings, with none eliminated on the avoided portion of the proposed route. Groundwater conditions are identical, as described in Section D.7.1.

Environmental Impacts and Mitigation Measures

This short alternative would avoid the use of Hoffman and Orange Streets, substituting a segment of Hillside and East Market Streets. Construction in this segment would have the same impacts as those described for the underground segment of the Proposed Project in Section D.7.3.3. Standard construction mitigation measures (H-1a, H-2a) would reduce construction impacts to less than significant levels. No substations would be affected in this route segment, and no water crossings occur, so Impacts H-3, H-4, H-7, and H-8 would not apply. Mitigation Measure H-9a would ensure that groundwater flow would not be affected by construction.

Comparison to Proposed Project Segment

From a water resources standpoint, there is no difference in impact between this alternative and the Proposed Project.

D.7.5.5 Junipero Serra Alternative

Environmental Setting

The general environmental setting for this alternative is similar to that of the Proposed Project described in Section D.7.1; however, this alternative would eliminate six urban stream crossings (those numbered 14 to 19 in Figure D.7-1d). Three small urban stream crossings would be added along the alternative route. Like the equivalent segment of the proposed route, the alternative route is within the Westside Groundwater Basin.

Environmental Impacts and Mitigation Measures

This alternative would avoid the use of the BART ROW, McLellan Avenue, and a portion of Hillside Drive. The alternative would require construction in Westborough Boulevard, Junipero Serra Boulevard, and Serramonte. Construction in this segment would have the same impacts as those described for the underground segment of the Proposed Project in Section D.7.3.3. Standard construction mitigation measures (H-1a, H-2a) would reduce construction impacts to less than significant levels. No substations would be affected in this route segment. The three water crossings would result in Impacts H-3, H-4, H-7, and H-8, requiring implementation of Mitigation Measures H-4a, H-7a, and H-8a to ensure that impacts are less than significant. Mitigation Measure H-9a would ensure that groundwater flow would not be affected by construction.

Comparison to Proposed Project Segment

This alternative differs from the Proposed Project by having three fewer stream crossings. This would reduce the risk of surface water contamination, but would not change the level of significance of impacts (both would be less than significant with mitigation implemented).

D.7.5.6 Modified Existing 230 kV Underground ROW

Environmental Setting

This alternative would utilize an existing PG&E underground transmission line route for part of its length, but the remainder would be installed east of Highway 101 to avoid utility congestion. This alternative is in an urban setting and it would be entirely underground. This alternative route would cross 10 watercourses. Three of the relatively large crossings are Colma Creek, a tributary to Colma Creek, and the Guadalupe Valley. Groundwater basins crossed include the Westside and Visitacion Valley basins.

Environmental Impacts and Mitigation Measures

Construction in this segment would have the same impacts as those described for the underground segment of the Proposed Project in Section D.7.3.3, but the reduced length of this alternative would reduce overall construction impacts. Standard construction mitigation measures (H-1a, H-2a) would reduce construction impacts to less than significant levels. The three water crossings would result in Impacts H-3, H-4, H-7, and H-8, requiring implementation of Mitigation Measures H-4a, H-7a, and H-8a to ensure that impacts are less than significant. Mitigation Measure H-9a would ensure that groundwater flow would not be affected by construction.

Impact H-6 (water quality degradation during construction) could occur in this alternative as it could on the Proposed Project route, but this route would require the bored or directionally-drilled crossings of several waterways, including Colma Creek and a tributary of Colma Creek, in locations relatively close to San Francisco Bay. Water quality in these waterways and downstream areas could be affected by an accidental release of drilling muds (a "frac-out"), which commonly occurs on bored or drilled water crossings. Mitigation Measure B-1h is intended to reduce the effect of frac-out contamination. With Mitigation Measure B-1h in effect, Impact H-6 would be reduced to less than significant (Class II). In addition, this alternative would cross the Guadalupe Watershed, which has a designated TMDL for mercury.

Impact H-8 (cable exposure due to scour and erosion) would be negligible with the exception of the bored crossings described in the previous paragraph. Most crossings would be in existing streets, and drilled crossings would generally occur at a depth substantially greater than the depth of scour. Mitigation Measure H-8a would ensure proper burial at stream crossings, ensuring that Impact H-8 would be less than significant.

Comparison to Proposed Project Segment

In general, the impacts of this alternative are similar to those of the Proposed Project. The Modified Existing 230 kV Underground ROW alternative would be much shorter than the Proposed Project route and would cross two fewer watercourses. However, these reduced impacts would be offset by the fact that the alternative route requires directional drilling in streams close to San Francisco Bay, requiring additional mitigation (Mitigation Measure B-1h) to protect water quality.

D.7.6 Environmental Impacts of the No Project Alternative

The No Project Alternative scenario would consist of upgrading, retrofitting or enhancing existing facilities, and the installation of turbine generators in the CCSF. The construction of these improvements to most of these existing facilities would likely have minimal water resources impacts because very little ground disturbance would likely be required. A possible exception would be the Potrero–Hunters Point 115 kV underground cable. However, since this may be installed in conjunction with a light rail project, impacts related to the power line alone would be minimal. The installation of new turbine generators in the CCSF would likely occur in an industrial area with disturbed and graded surfaces, so erosion would likely be minimal. However, general construction activities associated with installation of the new turbines could contaminate surface and groundwater if appropriate protective measures were not taken.

D.7.7 Mitigation Monitoring, Compliance, and Reporting Table

Table D.7-3 presents the mitigation monitoring, compliance, and reporting information for hydrology and water quality.

Table D.7-3. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
H-1: Soil Erosion and Sedimentation from Construction Activity and Access Roads (Class II)	**H-1a: Erosion and Sedimentation Control.** The Erosion Control and Sediment Transport Plan, Stormwater Pollution Prevention Plan, and Revegetation Plan required by APM 9.1 shall be reviewed and approved by the San Francisco Public Utilities Commission for those portions of the project within the Peninsula Watershed, for compliance with the Peninsula Watershed Plan prior to initiation of construction. Verification of SFPUC approval shall be provided to the CPUC at least 60 days before construction. **APM 9.1:** An erosion control and sediment transport control plan will be prepared in association with the SWPPP and the revegetation plan. This plan will be prepared in accordance with RWQCB guidelines and other applicable BMPs. Implementation of the plan will help stabilize graded areas and waterways, and reduce erosion and sedimentation. The plan will designate BMPs that will be followed during construction activities. Erosion-minimizing efforts may include measures such as avoiding excessive disturbance of steep slopes; using drainage control structures (e.g., coir rolls or silt fences) to direct surface runoff away from disturbed areas; strictly controlling vehicular traffic; implementing a dust-control program during construction; restricting access to sensitive areas; using vehicle mats in wet areas; and revegetating disturbed areas following construction. Erosion-control measures will be installed before extensive clearing and grading begins, and before the onset of winter rains. Concrete washout stations will be established to avoid direct release to surface water or to areas where groundwater could become contaminated. In areas where soils are to be temporarily stockpiled, soils will be placed in a controlled area and managed with similar erosion-control techniques. In the case of hand-dug foundations, excavated soils will be collected in bins or drums to be lifted out by helicopter or used	Within Peninsula Watershed	Erosion Control and Sediment Transport Plan, Stormwater Pollution Prevention Plan, and Revegetation Plan to be submitted to San Francisco Public Utilities Commission for review.	San Francisco Public Utilities Commission must approve plans	CPUC and SFPUC	Prior to construction

Table D.7-3. Mitigation Monitoring Program – Hydrology and Water Quality (cont.)

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	as part of the Revegetation Plan (refer to Chapter 6 of the PEA, Biological Resources). Where construction activities occur near a surface waterbody or drainage channel, stockpiles will be placed at least 100 feet from the waterbody or properly contained (such as bermed or covered to minimize risk of sediment transport to the drainage). Mulching, seeding, or other suitable stabilization measures will be used to protect exposed areas during and after construction activities. Revegetation plans, the design and location of retention/settlement ponds, and grading plans will be submitted to the CDFG and COE for review if construction requires a Streambed Alteration Agreement or Section 404 Permit, respectively. The Stormwater Pollution Prevention Plan (SWPPP) will be designed specifically for the hydrologic setting of the proposed Project, which includes water-supply reservoirs, upland slopes, and intermittent and seasonal streams. BMPs documented in the Erosion Control and Sediment Transport Plan will also be included in the SWPPP. As previously noted, the staging of construction materials, equipment, and excavation spoils will be performed at least 100 feet outside of drainage channels, intermittent streams, and reservoirs, where these receive overland runoff. This measure would not be required where runoff is already directed away from the channels, such as at Colma Creek where the channel lip is constructed above grade or where other protection measures such as berming and/or covering of stockpiles is performed. The SWPPP will identify such special circumstances. Trench spoils from the underground transmission line may be stockpiled and used to backfill the trench, and, upon completion of construction activities, the area will be graded to match the surroundings. In general, as described in Chapter 2 of the PEA, Project Description soils under the streets and in the BART ROW are unlikely to meet the specific backfill requirements and will be hauled offsite immediately after excavation. Open					

Table D.7-3. Mitigation Monitoring Program – Hydrology and Water Quality (cont.)

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	portions of the trench will be covered when not under active construction. Temporary stockpiles of excavated soil will be collected and placed in a controlled area and managed with erosion control techniques as noted in the Project's Erosion Control and Sediment Transport Plan and SWPPP. Standard erosion and dust-control practices will be used during construction according to BMPs to protect biological and hydrological resources. Surplus soils will be transported from the site and appropriately disposed.					
H-2: Degradation of Surface or Ground Water Quality Through Spill of Potentially Harmful Materials Used In Construction (Class II)	**H-2a: Hazardous Substance Control.** The environmental training and monitoring program and hazardous substance control and emergency response plan required by APMs 9.2 and 9.3 shall be reviewed and approved by the San Francisco Public Utilities Commission for those portions of the project within the Peninsula Watershed prior to initiation of construction. Verification of SFPUC approval shall be provided to the SFPUC at least 60 days prior to construction. **APM 9.2:** An environmental training program will be established to communicate environmental concerns and appropriate work practices, including spill prevention and response measures and proper BMP implementation, to all field personnel. The training program will emphasize site-specific physical conditions to improve hazard prevention (e.g., identification of flow paths to nearest waterbodies) and will include a review of all site-specific plans, including but not limited to the Project's SWPPP, Erosion Control and Sediment Transport Plan, Health and Safety Plan, and Hazardous Substances Control and Emergency Response Plan. A monitoring program will also be implemented to ensure that the plans are followed throughout the construction period. BMPs, as identified in the Project SWPPP and Erosion Control and Sediment Transport Plan, will also be implemented during the Project to minimize the risk of an accidental release and provide the necessary information for emergency response.	Entire route	Environmental training and monitoring program and hazardous substance control and emergency response plan to be submitted to San Francisco Public Utilities Commission for review.	San Francisco Public Utilities Commission must approve plans	CPUC and SFPUC	Prior to construction

Table D.7-3. Mitigation Monitoring Program – Hydrology and Water Quality (cont.)

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
H-4: Encroachment Into a Floodplain or Watercourse by Substations, Transfer Station or Power Poles (Class II)	**H-4a: Flood Damage Prevention.** Aboveground project features such as power poles, substations, and transfer stations shall be placed outside the flow path of watercourses unless an engineering analysis, reviewed and approved by the California Public Utilities Commission and San Francisco Public Utilities Commission (for areas within the Peninsula Watershed), demonstrates that watercourse avoidance is not practicable, and that appropriate measures have been taken to identify and prevent potential flooding and erosion hazards. PG&E shall document to the CPUC at least 60 days before the start of construction which structures, if any, would be in flow paths and what protective measures are proposed.	All above-ground features attached to the ground.	Submit documentation and engineering analysis to named agencies.	Agencies must concur with compliance	CPUC and SFPUC	Prior to construction
H-7: Water Quality Degradation Caused by Accidental Releases of Oil from Substations or Transition Station (Class II for substations, switchyards, and taps; Class III)	**H-7a: Operational Oil Releases.** The appropriate agencies for review of the Spill Prevention, Countermeasure, and Control Plans described in APM 9.6 (Spill Prevention) shall include the San Francisco Public Utilities Commission for substations, switchyards, and taps located within the Peninsula Watershed. PG&E shall document to the CPUC the SFPUC's approval of SPPCPs at least 60 days before construction. **APM 9.3:** PG&E will prepare a Hazardous Substance Control and Emergency Response Plan that will include preparations for quick and safe cleanup of accidental spills. This plan will be submitted with the grading-permit application. It will prescribe hazardous-materials handling procedures to reduce the potential for a spill during construction, and will include an emergency response program to ensure quick and safe cleanup of accidental spills. The plan will identify areas where refueling and vehicle-maintenance activities and storage of hazardous materials, if any, will be permitted. These directions and requirements will also be reiterated in the Project SWPPP. **APM 9.4:** Oil-absorbent material, tarps, and storage drums will be used to contain and control any minor releases of transformer oil. In the event that excess	Substations Within the Peninsula Watershed	Spill Prevention, Countermeasure, and Control Plans to be submitted to San Francisco Public Utilities Commission for review.	San Francisco Public Utilities Commission must approve plans	CPUC and SFPUC	Prior to construction

Table D.7-3. Mitigation Monitoring Program – Hydrology and Water Quality (cont.)

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	water and liquid concrete escapes from tower foundations 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 **APM 9.6:** PG&E will prepare or modify existing Spill Prevention, Countermeasure, and Control (SPCC) plans for the proposed transition station and substations as required by applicable regulations. The plan will include engineered and operational methods for preventing, containing, and controlling potential releases (e.g., construction of retention pond, moats, or berms), and provisions for quick and safe cleanup. The plan will be submitted to the appropriate agency for review. Existing SPCC plans for the substations mentioned above will be revised to include new equipment. Incorporation of SPCC measures in the Project design will reduce impacts to less than significant levels. (Also see Chapter 11 of the PEA, Hazards, Hazardous Materials, and Public Health.)					
H-8: Exposure of the Underground Cable to Damage Through Stream Scour and Erosion (Class II)	**H-8a: Scour and Erosion.** At locations where the proposed cable will cross below or pass adjacent to streams with erodible bed or banks, the burial depth shall be extended below the estimated 100-year depth of scour for that stream, or located at a sufficient distance from the bank as to avoid erosion that can reasonably be expected to occur during the life of the project.	Locations where the proposed cable will cross below or pass adjacent to streams with erodible bed or banks.	Submit documentation and engineering analysis for review and approval.	Agencies must concur with compliance	CPUC	Prior to construction
H-9: Interruption of Groundwater Flow or Modification of Groundwater Depths During Construction of Underground Transmission Line	**H-9a: Construction Effects on Groundwater.** Groundwater levels along the underground transmission line route shall be tested by drilling pilot borings. The location, distribution, or frequency of such tests shall be determined to give adequate representation of the conditions along the underground line. Locations where groundwater depth is less than 8 ft deep shall	Along the underground transmission line route.	Submit test drilling letter report to the CPUC for review and if shallow groundwater is found review PG&E's specific proposal to minimize impacts.	If groundwater flow is not interrupted by the project.	CPUC	Prior to construction

Table D.7-3. Mitigation Monitoring Program – Hydrology and Water Quality (cont.)

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
(Class II)	be identified prior to trenching activities and avoided, where possible, for the underground route. Avoidance is especially recommended where shallow groundwater flow direction is not parallel to the orientation of the underground line. Where avoidance is not possible, PG&E shall consider construction in a shallower trench, depending upon structural requirements of the underground method and other practical concerns. PG&E shall document results of test drilling in a letter report to the CPUC at least 30 days before construction starts and shall propose specific means to minimize the impact on groundwater if shallow groundwater is found. These measures must be approved by the CPUC prior to the start of construction of the underground segment. **APM 9.5:** Soil sampling and potholing will be conducted 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 at tower locations and along the underground transmission-line routes, soil borings will be advanced to identify areas where contaminated groundwater may be contacted. The location, distribution, or frequency of such tests will give adequate representation of the conditions in the construction area. If suspected contaminated groundwater is encountered in the depths of the proposed construction areas, samples will be collected and submitted for laboratory analysis of petroleum hydrocarbons, metals, volatile organic compounds, and semi-volatile organic compounds. If necessary, ground-					

Table D.7-3. Mitigation Monitoring Program – Hydrology and Water Quality (cont.)

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	water 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 cities' storm-water drainage systems (with prior approval) or contained, tested, and disposed of by methods described above.					
H-10: Degradation of Water Quality Due to the Use of Motorized Watercraft (Class II)	**H-10a: Contamination From Motorized Watercraft.** Should the Underwater Cable Design Option be selected as part of the PG&E Route Option 1B – Underground Alternative, the following preventative measures shall be followed: • Motorized watercraft shall be steam-cleaned prior to entering the reservoir; • Oil-absorbent booms will be onboard all watercraft at all times; • Refueling of watercraft will occur out of the reservoir on dry land; and • All watercraft with outboard engines would utilize four-stroke engines meeting the California Air Resources Board new emission standards for outboard engines manufactured after 2001.	Work within the Lower Crystal Springs Reservoir associated with the 1B Option Alternative.	Implement as defined	If water quality of the reservoir is not reduced.	SFPUC, CPUC	During construction