D.8 HYDROLOGY AND WATER QUALITY

This section addresses the Proposed Project and alternatives as they would affect hydrology and water quality. Section D.8.1 provides a description of the environmental setting, and the applicable water quality regulations and requirements are introduced in Section D.8.2. An analysis of the Proposed Project impacts is in Section D.8.3, and the hydrology and water quality impacts related to the Project alternatives are in Sections D.8.4 through D.8.6.

D.8.1 Environmental Setting for the Proposed Project

D.8.1.1 Regional Setting

The Proposed Project is located in northwestern Riverside County and southeastern San Bernardino County. Elements of the Proposed Project are located in the incorporated Cities of Beaumont, Banning, Calimesa, Redlands, and Yucaipa as well as unincorporated areas of Riverside and San Bernardino Counties. The area encompassed by the Proposed Project straddles the division between two major hydrologic regions: the Colorado River Hydrologic Region to the east and the South Coast Hydrologic Region to the west (SCE, 2007aa). Within the South Coast Hydrologic Region, portions of the Project would be located in the Santa Ana River and San Jacinto Valley Hydrologic Units, while within the Colorado River Hydrologic Region portions of the Project would be located in the Whitewater Hydrologic Unit. Figures D.8-1 and D.8-2 and Table D.8-1 show the hydrologic regions, units, areas, and subareas within the Project area.

Table D.8-1 Hydrologic Divisions in the Project Area

Hydrologic Region	Hydrologic Unit	Hydrologic Area	Hydrologic Sub Area
South Coast	Santa Ana River	Upper Santa Ana River	Mill Creek
South Coast	Santa Ana River	Upper Santa Ana River	Reservoir
South Coast	Santa Ana River	San Timoteo	Beaumont
South Coast	Santa Ana River	San Timoteo	Yucaipa
South Coast	San Jacinto Valley	San Jacinto	Gilman Hot Springs
Colorado River	Whitewater	San Gorgonio	Banning

Source: Table 3.8-1 of the PEA (SCE, 2007aa)

Hydrologic Units

Santa Ana River Hydrologic Unit. The Santa Ana River Hydrologic Unit is located within the hydrological boundary of the South Coast Hydrologic Region. The Santa Ana River Hydrologic Unit is an arid region. As a result, there is little natural perennial surface water in the watershed. In the Santa Ana River Hydrologic Unit, flows consist mainly of snowmelt and storm runoff from the undeveloped land in the San Bernardino National Forest. River flow from Seven Oaks Dam to the City of San Bernardino consists mainly of storm flows, flows from the Lower San Timoteo Creek, and groundwater that is rising due to local geological features. From the City of San Bernardino to the City of Riverside, the river flows perennially and much of this portion of the river is operated as a flood control facility.

Within the boundaries of the Santa Ana River Hydrologic Unit in the Project area, elevations range from approximately 1,110 feet to the northwest to approximately 2,600 feet to the southeast. The portion of the route from the southeastern corner of the Santa Ana watershed that follows San Timoteo Canyon drops from approximately 2,600 ft in the east to approximately 1,560 feet to the west. The route then turns east

and climbs to approximately 2,800 feet before turning north. The remaining northeastern portion of the route drops from 2,800 feet in the east end to approximately 1,110 feet to the west.

The principal tributary streams in the Santa Ana River Hydrologic Unit originate in the San Bernardino and San Gabriel Mountains. These tributaries include the San Timoteo, Reche, Mill, Plunge, City, East Twin, Waterman Canyon, Devil Canyon, and Cajon Creeks and University Wash from the San Bernardino Mountains; and the Lone Pine, Lytle, Day, Cucamonga, Chino, and San Antonio Creeks from the San Gabriel Mountains. West of Beaumont, Noble Creek drains into San Timoteo Creek. The San Timoteo Hydrologic Area drains westward from the San Gorgonio Pass into the Upper Santa Ana River Hydrologic Area, both of which are part of the Santa Ana River Hydrologic Unit.

The Santa Ana River Hydrologic Unit is under the jurisdiction of the Santa Ana Regional Water Quality Control Board (SARWQCB), Region 8 (SCE, 2007a). The 1995 Water Quality Control Plan designates beneficial uses for water bodies within the Santa Ana Region.

San Jacinto Valley Hydrologic Unit. The San Jacinto Valley Hydrologic Unit is located within the hydrological boundary of the South Coast Hydrologic Region. The southern portion of the Project area is located at the summit of the San Gorgonio Pass, which divides two major watersheds: the San Jacinto Valley Hydrologic Unit to the west and the Whitewater Hydrologic Unit to the east. The majority of the City of Banning drains east into the San Gorgonio Hydrologic Area of the Whitewater Hydrologic Unit. The drainage divide generally runs north-south near Highland Springs Avenue, ending in the San Bernardino Mountains to the north and the San Jacinto Mountains to the south. The region west of this divide is part of the San Jacinto Hydrologic Area, which is part of the San Jacinto Valley Hydrologic Unit.

Elevations within the Project area rise to approximately 5,560 feet to the north and 2,880 feet to the south. East of the divide, in the southeast portion of the planning area, elevations fall to approximately 1,940 feet. The portion of the Proposed Project that travels through the San Jacinto Valley Hydrologic Unit is relatively small, approximately 1.75 miles in length, and the elevation within this area is relatively flat, ranging from a high of 2,600 feet at the western end, and gently sloping downward to approximately 2,520 feet at the eastern end. The southern portions of the planning area are located on the floor of the San Gorgonio Pass, with the northern portions extending into the San Bernardino Mountains (SCE, 2007a).

To the west of the peak of San Gorgonio Pass is an area that drains generally south into Potrero Creek. The existing transmission lines cross Potrero Creek to the east of the Beaumont Substation. Potrero Creek flows to the San Jacinto River within the San Jacinto Valley Hydrologic Unit. The San Jacinto Valley Hydrologic Unit drains into Canyon Lake and ultimately into Lake Elsinore.

The San Jacinto Valley Hydrologic Unit is hydrologically isolated from the Santa Ana River, but is under the jurisdiction of the SARWQCB. The Water Quality Control Plan, Santa Ana River Basin-Region 8, designates beneficial uses for water bodies within the San Jacinto Valley Hydrologic Unit (SCE, 2007a).

Whitewater Hydrologic Unit. The Whitewater Hydrologic Unit is located within the hydrological boundary of the Colorado River Hydrologic Region. The Project area includes potential development within the San Gorgonio Hydrologic Area, the westernmost sub-basin of the Whitewater Hydrologic Unit.

Elevations within the Project area rise to approximately 2,570 feet in the west and slope downward toward the east to a height of approximately 2,220 feet. East of the Potrero Creek drainage is Smith Creek and its tributaries, which flow into the east side of San Gorgonio Pass. Smith Creek is tributary to the San Gorgonio River. The existing transmission line crosses Smith Creek within the City of Banning.

Click here for Figure D.8-1

Click here for Figure D.8-2

The San Gorgonio River is a tributary stream to the Whitewater River, and is hydrologically considered to be part of the Whitewater Hydrologic Unit. The Whitewater River flows southeast through the Coachella Valley into the Salton Sea.

The Colorado River Basin Regional Water Quality Control Board (CRBRWQCB) has jurisdiction over water quality and permitting for the Whitewater Hydrologic Unit. Beneficial uses of streams and rivers within the Whitewater Hydrologic Unit are designated in the Water Quality Control Plan for the Colorado River Basin – Region 7.

Surface Water

There are few large, confined bodies of water within the Project area. The surface waters adjacent to or crossed by the Proposed Project facilities include the streams and water bodies shown in Table D.8-2. The surface waters in the Project area are shown in Figure D.8-3.

Table D.8-2 Watershed and Drainage Crossings for the Proposed 115 kV Subtransmission Line Route

Hydrologic Unit	Watershed Extent (approximate)	Drainage Crossings	Milepost Extent
San Timoteo	Milepost 0 to 7.5	San Timoteo Creek	El Casco Substation
San Timoteo	Milepost 0 to 7.5	San Timoteo Wash	MP 3.6-5.5
San Jacinto	Milepost 7.5 to 9.4	Potrero Creek	MP 8.9
San Gorgonio	Milepost 9.4 to 13.6	Smith Creek	MP 10.1
San Gorgonio	Milepost 9.4 to 13.6	Montgomery Creek	MP 12.4

Source: Table 3.8-2 of the PEA (SCE, 2007a)

Groundwater

Colorado River Basin Region. The City of Banning is under the jurisdiction of the CRBRWQCB. It overlies the eastern portion of the Coachella Valley Groundwater Basin. The Coachella Valley Basin extends from the City of Banning east to the Salton Sea. The San Gorgonio Pass sub-basin underlies the City of Banning. Approximately 15 miles long, this sub-basin is located in an east to west trending narrow valley between the San Jacinto and San Bernardino Mountains. The City of Beaumont is at the western end of the sub-basin, just outside the summit of the drainage area. The City of Banning has historically pumped groundwater from storage units located within the San Gorgonio Pass sub-basin in Banning Canyon (SCE, 2007a).

Most of the proposed subtransmission route (from approximately MP 7.5 to Banning Substation) is underlain by the Banning Storage Unit. Depth to groundwater within this storage unit, as measured in 2004, is over 300 feet below ground surface (bgs) (City of Banning, 2005).

Santa Ana Region. The City of Beaumont is under the jurisdiction of the SARWQCB. This region encompasses the Santa Ana River and San Jacinto Hydrologic Units. The City of Beaumont overlies the San Timoteo Hydrologic Area located in the northern portion of the Santa Ana Region. Historically, the City of Beaumont water supply has been drawn from the Beaumont Groundwater Storage Unit (BSU), which underlies the City and surrounding areas. The BSU is located within the Beaumont Hydrologic Sub Area of the San Timoteo Hydrologic Area. A portion of the Beaumont Storage Unit is located in the Banning City limits, though this storage unit is primarily located within the City of Beaumont (SCE, 2007a). Groundwater within the BSU primarily occurs in the older alluvium and the San Timoteo Formation at elevations ranging from approximately 160 ft bgs to 600 ft bgs (BCVWD, 2006).

Presently, there is no organized groundwater data collection program within the San Timoteo Canyon area, however past investigations have indicated that groundwater occurs in both the recent river sediments within San Timoteo Wash and the semi-consolidated sediments of the San Timoteo Formation (STWMA, 2005). As discussed below under Section D.8.1.2, Site Specific Conditions, depth to groundwater beneath the El Casco Substation site ranges from three to eight feet bgs (SCE, 2007a).

Flooding Potential

The Federal Emergency Management Agency (FEMA) is responsible for mapping the areas that are predicted to flood during 100-year and 500-year storm events. Flood hazard zones are identified by FEMA on Flood Insurance Rate Maps. The maps indicate the estimated level of inundation under various conditions and intensities. There are no areas within the Proposed Project that are within the 100-year flood hazard zones (SCE, 2007a).

Regional flood control planning and facilities construction are within the jurisdiction of the Riverside County Flood Control District and the San Bernardino County Flood Control District. The Districts are also responsible for maintenance and operation of flood control facilities including debris, dams, storm channels, and storm drains.

Portions of the Proposed Project are in locations that are susceptible to flooding when heavy rains occur within steep mountainous areas. These floods can reach high velocities when they reach the valley floor. Drainages and other waterways in the area have the potential to overflow, causing flooding. The drainage areas within the Proposed Project area that are particularly subject to flooding are those in the vicinity of Smith and Noble Creeks (SCE, 2007a).

D.8.1.2 Site Specific Conditions

El Casco Substation Site

The El Casco Substation site is located in an undeveloped area of San Timoteo Canyon, south of San Timoteo Road in unincorporated Riverside County. The site is located in the Reservoir Hydrologic Sub Area. The canyon area has low hills on the north and south and drainage that generally runs east to west. Currently, the runoff from the substation site is from south to north, and drains to San Timoteo Creek. San Timoteo Creek flows southwest to northeast, where it later joins the upper reaches of the Santa Ana River south of San Bernardino. San Timoteo Creek is located between the substation site and San Timoteo Canyon Road. The northeast corner of the site is approximately 100 feet from the stream channel. San Timoteo Creek is a “Waters of the U.S.” and “Navigable Water,” as defined under the Clean Water Act, Sections 402 and 404.

The existing site slopes downward from south to north at an average slope of 40% in hillside areas and at an average of 5% in non-hillside areas (SCE, 2007a). The western portion of the site is predominantly located within a 125-acre watershed. In general, the runoff from the watershed sheet drains from south to north. The eastern portion of the site is located on the perimeter of an adjacent watershed area that does not significantly impact drainage on the site.

There is a channel denoted on the U.S. Geological Survey [USGS] topographic map as a blue-line stream (Figure D.8-4). The channel originates approximately 2,000 feet south of the site and flows toward San Timoteo Creek in a south to north direction. At approximately 800 feet south of the substation site, the channel fans out and becomes loosely defined. The channel remains this way along the substation site all the way to the San Timoteo Creek.

Click here for Figure D.8-3

Click here for Figure D.8-4

Soils at the substation site have moderate infiltration rates when saturated and consist mostly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission. Cover at the site can be classified as fair, being defined as moderate cover with 50 to 75 percent of the ground surface protected. Soil moisture conditions are described as having the lowest run-off potential due to the dryness of the site. The lack of a well-defined drainage channel at the El Casco Substation site indicates that stormwater from rainfall events during most years tends to infiltrate to the sub-surface rather than run off the site. Surface run-off from the canyons to the west, south, and upgradient of the site can be expected as a result of heavy winter storms. Large flow events on this watershed would cross the substation site. The substation site is not located within a FEMA designated 100-year or 500-year flood hazard zone as mapped by the Riverside County Transportation and Land Management Agency (TMLA) (SCE, 2007a). Water in the upper Santa Ana River Hydrologic Unit tends to be high quality, with low concentrations of total dissolved solids, nitrates, and other pollutants (SCE, 2007a). The SARWQCB has adopted specific beneficial uses and water quality objectives for San Timoteo Creek (SCE, 2007a). Designated beneficial uses for San Timoteo Creek include: AGR (Agriculture Supply), GWR (Ground Water Recharge), REC I (Water Contact Recreation), REC II (Non-Contact Water Recreation), WARM (Warm Freshwater Habitats) and WILD (Wildlife Habitat). San Timoteo Creek is not currently listed on the Clean Water Act Section 303, a list of "impaired" waters in California.

The area in the valley along San Timoteo Road has perched ground water at depths of three to eight feet bgs (SCE, 2007a). A geotechnical investigation encountered groundwater at shallow levels. A boring drilled at the north end of the proposed substation site, approximately 300 feet from San Timoteo Creek encountered moist soil between 10 and 15 feet below the surface, and wet soil at 15 feet. A boring drilled at the northeast corner of the substation site, approximately 120 feet from San Timoteo Creek encountered moist soil at less than 4 feet and wet at 10 feet (SCE, 2007a).

Banning Substation

The Banning Substation is located within a developed portion of the City of Banning and is within the Banning Hydrologic Sub Area. The closest major drainage is the San Gorgonio River, located within the Whitewater Hydrologic Unit under the jurisdiction of the CRBRWQCB. The Banning Substation is located outside a FEMA designated 100-year flood zone, but is within a 500-year flood zone (SCE, 2007a). Surface waters from the site drain into the city's stormwater drainage system. The substation site is located in a 500-year flood zone and is not considered to have a significant flood hazard (SCE, 2007a).

Zanja Substation

The Zanja Substation is located in the City of Yucaipa within the Reservoir Hydrologic Sub Area. The Zanja drainage channel, a tributary to Mill Creek, is adjacent to the substation. Mill Creek is a tributary to the Santa Ana River Hydrologic Unit and within the jurisdiction of the SARWQCB (SCE, 2007a). Surface waters in the vicinity of the Zanja Substation generally drain from east to west and flow into Spoor Creek, which in turn drains into Mill Creek approximately two miles west of the Zanja Substation (SCE, 2007a). The Zanja Substation is not within a FEMA designated 100-year flood hazard zone, but is located within a 500-year flood hazard zone (SCE, 2007a). Water quality in the upper Santa Ana River Hydrologic Unit tends to be high, with low concentrations of total dissolved solids, nitrates, and other pollutants.

115 kV Subtransmission Line Route

The approximate location of drainage crossings and floodways along the 115 kV subtransmission line route and the West and South Maraschino Subtransmission Line Loops are summarized in Table D.8-2,

above, and are shown on Figure D.8-5. The City of Beaumont's location at the top of the San Gorgonio Pass causes streams in and around the City to drain into three distinct watersheds as defined by the California EPA (SCE, 2007a). The subtransmission line route would pass through three distinct watershed hydrologic sub areas, including (from west to east) the Beaumont Hydrologic Sub Area of the San Timoteo Hydrologic Area, the Gilman Hot Springs Hydrologic Sub Area of the San Jacinto Hydrologic Area, and the Banning Hydrologic Sub Area of the San Gorgonio Hydrologic Area (SCE, 2007a).

Surface water drainage in the Project area is generally from southeast to northwest, with waters flowing into various creeks and channels including Montgomery Creek, Smith Creek, Potrero Creek, Noble Creek, and others, some of which are unnamed. The Montgomery, Smith, and Potrero Creeks all drain into the San Gorgonio River, while Noble Creek drains into San Timoteo Creek (SCE, 2007a).

Portions of the proposed subtransmission line route cross FEMA designated 100-year and 500-year flood hazard zones south and southwest of the City of Banning. The route crosses adjacent to several bodies of water including Smith Creek, Potrero Creek, Noble Creek, San Timoteo Creek, and Montgomery Creek. The Smith and Noble Creeks have been subjected to flooding in previous years. The flood hazards are shown below in Table D.8-3 and Figure D.8-5.

Table D.8-3 Flood Hazards for the Proposed 115 kV Subtransmission Line Route

Flood Hazard	Hydrologic Area	Drainage	Milepost Extent
500-year	San Gorgonio	Unnamed	MP 11.5
100-year	San Gorgonio	Montgomery Creek	MP 12.3 to 12.5
100-year	San Gorgonio	Montgomery Creek	MP 12.8 to 12.9
500-year	San Gorgonio	Unnamed	MP 12.75 to 12.8 and 12.9 to 12.95
500-year	San Gorgonio	Unnamed	MP 13.6 to 13.9

Source: Table 3.8-2 of the PEA (SCE, 2007a)

Fiber-Optic System

The El Casco-Banning segment of the proposed fiber optic system would be located within three watershed hydrologic sub areas, including 1) the Beaumont Hydrologic Sub Area, part of the San Timoteo Hydrologic Area, 2) the Gilman Hot Springs Hydrologic Sub Area, part of the San Jacinto Hydrologic Area, and 3) the Banning Hydrologic Sub Area, part of the San Gorgonio Hydrologic Area. The El Casco-M29 T2 and El Casco-M30 T2 segments of the proposed fiber optic system would be located within the Beaumont Hydrologic Sub Area, part of the San Timoteo Hydrologic Area. The Banning-M17 T1 segment of the system would be located within the Banning Hydrologic Sub Area, part of the San Gorgonio Hydrologic Area.

The area surrounding the El Casco-San Bernardino segment of the proposed fiber optic system currently drains into a number of watercourses and city stormwater systems. The area from the El Casco Substation to the Yucaipa Substation drains in a generally east to west direction, with surface waters flowing into the San Timoteo, Live Oak, and Wildwood Creeks. The area of the segment from the Yucaipa Substation to the Zanja Substation generally drains into the stormwater drainage system of the City of Yucaipa. From the Zanja Substation to the Mentone Substation, the surface waters generally drain directly into Zanja, Spoor, and Mill Creeks. From the Mentone Substation to the terminus of the new fiber optic system at the San Bernardino Substation, the surface waters generally drain into the stormwater drainage system of the City of Redlands.

Click here for Figure D.8-5

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The El Casco-Banning area of the proposed fiber optic system would have a similar drainage pattern as that of the Proposed Subtransmission Line Route, though for some portions of this segment of the fiber optic system the surface waters would drain southwest to the surface water channels as opposed to northwest. The surface waters in the vicinity of the El Casco-M29 T2 and El Casco-M30 T2 segments of the proposed fiber optic system would drain in a similar fashion to those on the proposed El Casco Substation Site.

The Banning-M17 T1 segment of the proposed fiber optic system would be largely located within a developed area of the City of Banning, and the surface waters in the area of this segment drain into the city's stormwater drainage system. The only exception would be the northernmost portion of this segment in the vicinity of the M17 T1 Transmission Tower, which would drain to the southwest into the San Gorgonio River (SCE, 2007a).

Portions of the proposed fiber optic route cross FEMA designated 100-year and 500-year flood hazard zones south and southwest of the City of Banning. The proposed fiber optic line route is adjacent to several bodies of water in the area. These bodies of water include the San Gorgonio, Smith, Potrero, Noble, San Timoteo, Live Oak, Yucaipa, Wildwood, Oak Glen, Gateway, Spoor, and Mill Creeks and the Santa Ana River. The proposed fiber optic line route crosses several of these bodies of water along the proposed route, including Smith Creek, Potrero Creek, Noble Creek, San Timoteo Creek, and Montgomery Creek (SCE, 2007a). Smith and Noble Creeks have been subjected to flooding in previous years.

Mill Creek Communications Site

The Mill Creek Communications Site is located within the San Bernardino National Forest in unincorporated San Bernardino County, on private property owned by SCE. The site is on Yucaipa Ridge, which drains to Mill Creek approximately one mile downgradient. Mill Creek is a tributary in the Mill Creek Hydrologic Sub Area of the Upper Santa Ana River Hydrologic Area, and is within the jurisdiction of the Santa Ana RWQCB (SCE, 2007a).

Surface water drainage in the vicinity of the Mill Creek Communications Site on Yucaipa Ridge is generally downslope to the north or south, with waters to the north draining toward Mill Creek, which in turn drains to the Santa Ana River. The Mill Creek Communications Site is not located within a FEMA designated 100-year floodplain (SCE, 2007a).

D.8.2 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).

Projects that disturb one or more acres are required to obtain NPDES coverage under the California General Permit for Discharges of Stormwater Associated with Construction Activity. The Construction General Permits require the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP describes Best Management Practices (BMPs) the discharger will use to protect

stormwater runoff. The SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

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 Colorado River Basin and Santa Ana Region Water Quality Control Plans. 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

Water Quality Control Plan for the Colorado River Basin Region (Basin Plan). The Basin Plan contains water quality standards for the Colorado River Basin Region applying to designated beneficial uses of surface and ground waters, narrative or numeric water quality objectives to protect those beneficial uses, and a policy to maintain high quality waters (i.e., anti-degradation policy). The Basin Plan also includes implementation plans for water quality objectives through various regulatory programs, and fulfills statutory requirements for water quality planning in California Water Code (CWC) section 13000 and the federal Clean Water Act (CWA) section 303(c) (CRBRWQCB, 1993).

Water Quality Control Plan for the Santa Ana Region RWQCB (Basin Plan). The Basin Plan establishes water quality standards for all the ground and surface waters of the region and include both the beneficial uses of specific waterbodies and the levels of quality which must be met and maintained to protect those uses. The Basin Plan includes an implementation plan describing the actions by the Regional Board and others that are necessary to achieve and maintain the water quality standards. The Regional Board regulates waste discharges to minimize and control their effects on the quality of the region's ground and surface water. Water quality problems in the region are listed in the Basin Plan, along with the causes, where they are known. For waterbodies with quality below the levels necessary to allow all the beneficial uses of the water to be met, plans for improving water quality are included. The Basin Plan also includes implementation plans for water quality objectives through various regulatory programs, and fulfills statutory requirements for water quality planning in California Water Code (CWC) section 13000 and the federal Clean Water Act (CWA) section 303(c) (SARWQCB, 1995).

D.8.3 Environmental Impacts and Mitigation Measures for the Proposed Project

D.8.3.1 Significance Criteria

The following significance criteria are based on the CEQA environmental checklist presented in Appendix G of the State CEQA Guidelines. Water resources impacts are considered to be significant if the Proposed Project:

- Violates any water quality standard or waste discharge requirement, or otherwise degrades water quality, including through providing substantial additional sources of polluted runoff.
- Substantially depletes groundwater supplies or interferes with groundwater recharge, such that there would be a net deficit in aquifer volume or a significant lowering of the local groundwater table (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, which includes the redirection of existing watercourses, creation of new discharge concentration points, or increasing the amount, frequency and rate of runoff, such that a substantial increase in downstream flooding, erosion, or siltation will occur.
- Creates or contributes runoff water that would exceed the capacity of existing or planned stormwater drainage systems.
- Places housing or structures within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or within a watercourse, which would impede or redirect flood flows to the detriment of adjacent property through flooding, erosion, or sedimentation.
- Results in or is subject to damage from inundation by seiche, tsunami, or mudflow.
- 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.

D.8.3.2 Applicant-Proposed Measures

SCE has committed to implementing the Applicant-Proposed Measures (APMs) presented in Table B.5-1 and D.8-4 to reduce hydrology and water quality impacts associated with operations and/or construction. These APMs are incorporated into additional more specific mitigation measures that are recommended to ensure that all impacts would be reduced to the extent feasible.

Table D.8-4. Applicant-Proposed Measures – Hydrology and Water Quality

APM	Description
APM HYDRO-1	Grading activities at the El Casco Substation site and improved access road would not commence if heavy rain is forecast for the period of time of major earthmoving activities through compaction and stabilization of the site.
APM HYDRO-2A	An engineering erosion control and drainage plan would be developed as part of the site grading plan. The plan would developed in accordance with the County of Riverside Hydrology Manual and would address all activities at the El Casco Substation site (including the areas of 220 kV transmission line and 115 kV Subtransmission line tie-ins and the duct banks.) The location of the discharge of site runoff for construction would be defined in final engineering and in consultation with Riverside County, the RWQCB, and the CDFG. The plan would include measures for stormwater energy dissipation in areas subject to concentrated flow. Energy dissipation measures would include rip rap, weirs, natural vegetation, gabions, or other measures. Infiltration pits, sediment filter fabrics, fabric rolls, vegetated swales, or other measures would be used to protect water quality. The energy dissipation plan would be designed to prevent impacts to the riparian channel from high energy discharges and the discharge of fluids with high levels of sediment or other detrimental contaminants. These energy dissipation and erosion control measures could require the use of land on the El Casco Substation site parcel or between the parcel and creek.

Table D.8-4. Applicant-Proposed Measures – Hydrology and Water Quality

APM	Description
APM HYDRO-2B	If any Project construction requires that a watercourse be altered or relocated, the flood carrying capacity of the altered or relocated portion of the watercourse shall be maintained. Adjacent communities, the California Department of Water Resources, California Department of Fish and Game (Section 1600 Streambed Alteration Agreement), and FEMA shall be notified of any such alteration or relocation. Plans to meet the above requirements shall be prepared and certified by a civil engineer registered in the State of California.
APM HYDRO-2C	SCE shall develop an erosion control plan incorporating construction-phase measures to limit and control erosion and siltation. The erosion control plan shall include components such as: phasing of grading, limiting areas of disturbance, diversion of runoff away from disturbed areas, protective measures for sensitive areas, outlet protection, and provision for revegetation or mulching. The plan shall also prescribe treatment measures to trap sediment once it has been mobilized, at a scale and density appropriate to the size and slope of the catchment. These measures typically include: inlet protection, straw bale barriers, straw mulching, straw wattles, silt fencing, check dams, terracing, and siltation or sediment ponds.
APM HYDRO-2D	An environmental training program would be established to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, to all field personnel involved in the construction of the Proposed Project elements. A monitoring program would be implemented to ensure that the plans are followed throughout the period of construction.
APM HYDRO-3	In the event that excess water and liquid concrete escapes from pole foundations during pouring, it would be directed to bermed areas adjacent to the borings where the water would infiltrate or evaporate and the concrete would remain and begin to set. Once the excess concrete has been allowed to set, but before it is dry, it would be removed and transported to an approved landfill for disposal.
APM HYDRO-4	If groundwater is encountered while excavating or constructing the Subtransmission Line, it would be tested for contaminants. If contaminants are identified, they would be contained and disposed of in accordance with all federal, state, and local regulations.
APM HYDRO-5	Dewatering would involve pumping water out of excavations to allow construction of the pier footings. Water produced during dewatering activities would include sediment from the excavation, and could include lubricants used in the pumping process. During dewatering, SCE would, as applicable, use measures to avoid adverse effects related to discharging the water. Measures may include sediment traps and sediment basins in accordance with BMP BS-2 (Dewatering Operations) from the California Stormwater Quality Association's (CASQA) California Stormwater BMP Handbook. Measures may also include using above-ground holding tanks and pumping the water in the excavated area into the tank for sediment filtration. Sediment would then be filtered or decanted prior to discharge into the prescribed drainage location.
APM HYDRO-6	The HDD contractor shall be provided with copies of all applicable mitigation measures and permit conditions so that construction activities associated with the installation of the 12 kV and fiber optic conduit duct banks would be conducted in accordance with NPDES requirements. Measures to mitigate potential water quality impacts may also include, but not be limited to, the following measures: • Use mulch, seed, or gravel to disturbed areas for the purpose of providing temporary erosion protection. • Cover spoils piles with a tarp or contain within a sediment barrier. • Use sediment barriers such as silt fences, sand bags, straw bales, rock checks and/or sediment traps to contain sediment on site.
APM HYDRO-7	Prior to final engineering of the proposed access road to the El Casco Substation site, SCE would consult with Riverside County, CDFG, and the Santa Ana RWQCB regarding the location of the access road. The access road should be located 25 feet from the top of the creek bank. The existing access road should be reclaimed and revegetated with native vegetation determined by a qualified biologist in consultation with CDFG.
APM HYDRO-8	SCE would prepare a Hazardous Substance Control and Emergency Response Plan, which would include preparations for quick and safe cleanup of accidental spills. This plan would be submitted to agencies with the grading permit application. It would prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and would include an emergency response program to ensure quick and safe cleanup of accidental spills. The plan would identify areas where refueling and vehicle maintenance activities and storage of hazardous materials, if any, would be permitted. Oil-absorbent materials, tarps, and storage drums would be used to contain and control any minor releases of mineral oil that may occur at the El Casco Substation site

Source: SCE, 2007a

D.8.3.3 Proposed Project Impact Analysis

Impact HYD-1: Soil erosion and sedimentation caused by construction activities would degrade water quality (Class II).

Disturbance of soil during construction could result in soil erosion and sedimentation, as discussed in Section D.6 (Geology). Impact G-1 (Construction activities would cause slope instability) and Impact G-2 (Construction activities would accelerate erosion) both describe that construction activities, including grading and excavation, are expected to cause slope instability and erosion. Construction activities along the length of the proposed route would take place on a variety of gradients, from level ground to a range of slopes. Approximately 40 percent of the soils along the proposed route would have moderate erosion potential. Section D.6 also states that potential geologic impacts related to slope instability and erosion would be mitigated to less-than-significant levels. If slope stability and erosion were to occur in connection with Project-related construction activities, sediment deposition and subsequent elevated turbidity could cause a decrease in water quality of waterways in the area of the Proposed Project.

Transmission line construction would require excavation and grading for individual transmission tower footings and foundations, temporary construction areas, as well as improvement of existing access and spur roads. In particular, construction would involve improving 0.6 mile of an existing unpaved road that connects San Timoteo Canyon Road to the substation site. Improvement of the substation access road could cause adverse impacts to water quality in San Timoteo Creek by accelerating soil erosion rates and sedimentation in the creek and downstream waterways. The existing road is less than five feet from the creek bank in some locations. Uncontrolled runoff during road construction could accelerate and increase sedimentation in the creek. The net effects of road improvement could include an increase in turbidity within the creek, an increase in sedimentation due to erosion of soils during construction of the road, and a corresponding reduction of the creek's carrying capacity due to sedimentation. Also, construction of the road in close proximity to the creek could accelerate erosion of already unstable creek banks.

SCE has committed to implementing APMs HYDRO-1(Prohibit grading activities during heavy rains) HYDRO-2a (Develop engineering erosion control and drainage plan), HYDRO-2c (Develop erosion control plan), and HYDRO-7 (Coordinate with appropriate regulatory agencies regarding the location of the access road). In addition SCE has committed to perform transmission line and substation construction activities in accordance with the soil erosion/water quality protection measures specified in the Construction Stormwater Pollution Prevention Plan (SWPPP). In accordance with Section 402 of the federal Clean Water Act (CWA) and the State Water Resources Control Board (SWRCB), any construction project which disturbs one acre or more of ground surface must prepare a Construction SWPPP (SWRCB, 2006). The SWPPP would be prepared once the Proposed Project is approved and after the necessary facilities are sited and designed, in order to ensure site-specific conditions are effectively addressed. All SWPPPs must include BMPs for erosion and sediment control, as well as for construction waste handling and disposal (SARWQCB, 2006). However, the SARWQCB does not specify the exact content of BMPs to be included in the SWPPP. APM HYDRO-2a further addresses construction impacts by requiring an erosion and sediment transport control plan, which would be implemented as part of the SWPPP to reduce potential impacts from soil erosion and sedimentation. This plan would require BMPs for construction activities including erosion-minimizing efforts such as hay bales, water bars, covers, and sediment fences; restricted access to sensitive areas; use of vehicle mats in wet areas; and installation of retention/settlement ponds prior to the onset of extensive clearing and grading.

In addition, as discussed in section D.6, Geology, APM GEO-1 would be implemented to facilitate understanding of site-specific geologic conditions and minimize erosion from construction. Mitigation Measures GEO-1 (Protect Against Slope Instability), GEO-2a (Minimization of Soil Erosion), and GEO-2b (Road Surface Treatment), would be implemented to strengthen the applicable APM and further reduce

potential impacts to water quality from soil erosion. In order to reduce the potential for degradation of water quality from construction-related erosion and sedimentation to a less-than-significant level, additional, specific mitigation measures are recommended, as described below. With the implementation of Mitigation Measures HYD-1a (Implementation of Erosion and Sediment BMPs), HYD-1b (Timing of Construction Activities), HYD-1c (Dispersion of Subsurface Drainage from Slope Construction Areas), and HYD-1d (Control of Side-Cast Material, Right-of-Way Debris, and Roadway Debris), Impact HYD-1 for the Proposed Project would be reduced to a less-than-significant level (Class II).

Mitigation Measures for Impact HYD-1

HYD-1a Implementation of Erosion and Sediment BMPs. The following BMPs shall be implemented in order to minimize potential hydrologic and water quality impacts of erosion and sedimentation created through Project construction:

- Mechanical and vegetative measures shall be implemented to provide surface soil stability where necessary. Mechanical measures may include but are not limited to: wattles, erosion nets, terraces, side drains, blankets, mats, riprapping, mulch, tackifiers, pavement, soil seals, and windrowing construction slash at the toe of fill slopes. Vegetative measures shall be used to supplement mechanical measures, as appropriate.
- Road slope stabilization practices shall be implemented prior to the first winter rains. These practices shall include: verification of the correct slope steepness as dependent upon the dominant soil type/s present, implementation of methods to handle surface and subsurface runoff, and finalization of road surface compaction or application of appropriate surfacing material.
- Any temporary roadways which are built or used for the purpose of transporting construction equipment and materials to construction sites shall be situated to prevent undercutting of the designated final cut slope, avoid deposition of materials outside the designated roadway limits, and accommodate drainage with temporary culverts as necessary.
- Embankment methods shall be implemented to ensure adequate strength of the roadway and shoulder and to minimize potential failure of road embankments and fill areas. Acceptable stabilization methods include: sidecasting and end dumping, layer placement (roller compaction), controlled compaction, minimization of fill volumes, or strengthening of fills using retaining walls, confinement systems, plantings, or a combination of techniques. The appropriate stabilization effort shall be determined by the supervising project or crew leader prior to the onset of construction, based on site-specific conditions.
- Strictly control vehicular traffic to only that which is necessary.
- Restore temporary construction areas (e.g., temporary roads, pulling and splicing stations) to a near-natural condition and ensure that the sites are re-vegetated and stabilized, unless operation and maintenance of the Project would require the areas to remain clear.
- Establish the use of concrete washout stations to capture and contain concrete washout material and wastewater to avoid direct release of washout to surface water.

- Erosion control measures shall be completed prior to the first anticipated rains at all construction sites. An Erosion Control Plan shall be prepared as part of the Project SWPPP.

HYD-1b Timing of Construction Activities. Construction activities, particularly regarding roadway installations and improvements, must occur during the dry season (April to October) or when precipitation events are not expected.

HYD-1c Dispersion of Subsurface Drainage from Slope Construction Areas. In order to minimize sediment production from the potential failure of slope construction areas, subsurface drainage devices shall be implemented where necessary, as determined during final siting and engineering of transmission towers. Where it is determined necessary due to site-specific conditions such as slope severity, soil condition, precipitation levels, and inherent instability, subsurface drainage will be utilized to avoid moisture saturation and potential subsequent slope failure. Subsurface dispersion methods would include underdrains or subdrains such as pipes, horizontal drains, or chimney drains.

HYD-1d Control of Side-Cast Material, Right-of-Way Debris, and Roadway Debris . Side-cast material includes any loose, unconsolidated materials that must be re-located to facilitate construction activities. This may include rocks and boulders as well as organic materials. Prior to the onset of any construction activities, waste areas must be designated where excess material can be deposited and stabilized. During road construction and maintenance, potential sidecast and other waste material will be utilized on the road surface. Any unused material shall be removed to designated disposal sites. Waste areas shall not be left exposed and must be transported to disposal facilities on a regular basis, which will be determined based on site-specific conditions.

GEO-1 Protect Against Slope Instability. Appropriate support and protection measures shall be implemented to maintain the stability of excavations and protect surrounding structures and utilities to limit ground deformation. Design-level geotechnical investigations shall be performed to evaluate subsurface conditions, identify potential hazards, and provide information for development of excavation plans and procedures. Based on the results of the geotechnical investigations, appropriate support and protection measures shall be designed and implemented to maintain the stability of slopes adjacent to newly graded or re-graded access roads and work areas during and after construction. These measures shall include, but are not limited to, retaining walls, visqueen, removal of unstable materials, and avoidance of highly unstable areas. SCE shall document compliance with this measure prior to the start of construction by submitting a report to the CPUC for review and approval. The report shall document the investigations and detail the specific support and protection measures that will be implemented.

GEO-2 Minimize Soil Erosion. The Construction SWPPP for the Project shall include BMPs designed to minimize soil erosion along access roads and at work areas. Appropriate BMPs may include construction of water bars, grading road surfaces to direct flow away from natural slopes, use of soil stabilizers, and consistent maintenance of roads and culverts to maintain appropriate flow paths. Silt fences and straw bales installed during construction shall be removed to restore natural drainage during the cleanup and restoration phase of the Proposed Project. Where access roads cross streams or drainages, they shall be built at or close to right angles to the streambeds and washes and culverts or rock crossings shall be

used to cross streambeds and washes. Design of appropriate BMPs should be conducted by or under the direction of a qualified geologist or engineer.

Impact HYD-2: Degradation of surface water or groundwater quality would occur from the accidental release of potentially harmful materials during construction activities (Class II).

Surface water and groundwater quality could potentially be impacted during construction activities if any potentially harmful materials are accidentally spilled. This impact could occur at pole or tower installation locations, site laydown and preparation areas, substation expansion sites, and other locations where construction activities would occur. The preparation and pouring of concrete and the use of motorized equipment are examples of construction activities that would specifically involve the use of potentially harmful materials. Some of the materials of concern (potentially hazardous substances) include diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, lubricant grease, and other fluids. If any of these materials are accidentally released during construction, they could pollute surface water through direct runoff into nearby water bodies, and/or pollute groundwater through soil infiltration or direct runoff, if the groundwater table is exposed due to excavation. The waters of San Timoteo Creek, local tributaries, and other streams could receive these potentially harmful materials in the case of an accidental spill. Additionally, since groundwater has been encountered at depths as high as three feet bgs at the El Casco Substation site and occurs at unknown depths between the El Casco and Maraschino substations, an accidental release at the site could directly affect water, especially during periods of active excavation and grading.

Construction activities would also include installing two bore casings underground for a length of approximately 300 feet to allow for installation of duct banks beneath San Timoteo Creek and the Union Pacific Railroad ROW. These casings would be installed using horizontal directional drilling (HDD). This process, which is described in Section B.7.2.2 (Horizontal Directional Drilling) has the potential to cause an adverse effect on water quality in San Timoteo Creek from transmission of hazardous materials from equipment during boring or through vertical leakage of drilling fluids in the formation over the boring. Such vertical leakage is also known as “frac-out.” Frac-out occurs when fluid migrates through existing natural fractures, induced fractures, or porous and permeable zones (gravel and cobble) to reach the surface. Frac-outs are caused when excessive drilling pressure results in drilling mud moving vertically toward the surface. If frac-out occurred during HDD activities, drilling fluids from the drill casing would enter the creek, thereby degrading surface water quality. This would be a significant impact.

SCE has committed to several measures to avoid the potential to degrade surface water quality during construction activities, including HDD. APMs HYDRO-2a and HYDRO-2c would reduce the potential for erosion and sedimentation to occur during construction. APM HYDRO-2b would require that the flood carrying capacity of San Timoteo Creek be maintained if construction required the creek to be altered (also requiring a Section 1600 Streambed Alteration Agreement, a Section 404 permit, and a Section 401 waiver or permit if HDD occurs within the ordinary high water mark of the creek). APM HYDRO-2d would require training construction workers in spill prevention and response procedures. APM HYDRO-3 would require excess water and liquid concrete from pole foundations be directed to bermed areas where water could evaporate and the set concrete be removed without impacts to surface waters. APM-HYDRO-6 would require that HDD be performed in accordance with NPDES requirements. APM HYDRO-8 would require preparation and implementation of a Hazardous Substance Control and Emergency Response Plan. In order to strengthen these APMs, the following mitigation measures would also be implemented to reduce the potential for a release during HDD

activities: HYD-2a (Prevent Frac-out), HYD-2b (Implement HDD BMPs), HYD-2c (Prepare and Implement Frac-out Response Plan), and HYD-2d (Develop and Implement a Groundwater Remediation Plan). These mitigation measures add specific requirements to the planned APMs and would ensure that impacts to water quality as a result of construction activities are reduced to a less-than-significant level (Class II).

Mitigation Measures for Impact HYD-2

HYD-2a Prevent Frac-out. SCE's HDD contractor shall take the following precautions to prevent frac-out from occurring during drilling activities:

- Ensure that HDD casings are drilled to a depth of at least eight (8) feet below the bottom of San Timoteo Creek.
- Ensure HDD machinery arrives onsite in clean condition and is free of fluid leaks.
- Wash, refuel, and service machinery and store fuel and other materials for the machinery at least 50 feet away from San Timoteo Creek to prevent any hazardous substances from entering the water.
- Keep emergency spill kits on site in case of fluid leaks or spills from machinery.
- Restore banks to original condition if any disturbance occurs.
- Ensure drilling mud, sediment-laden water, and any other deleterious substances are contained above the high water mark and do not enter San Timoteo Creek.
- Dispose of excess drilling mud, cuttings, and other waste materials at an adequately sized disposal facility located at least 50 feet away from San Timoteo Creek to prevent it from entering the watercourse.
- Monitor San Timoteo Creek to observe signs of surface migration (frac-out) of drilling mud during all phases of construction.

HYD-2b Implement HDD BMPs. SCE's HDD contractor shall implement BMPs during HDD activities to prevent water quality degradation. These measures shall include, but not be limited to:

- Perform all HDD activities outside of the rainy season (November to March). HDD activities shall be scheduled to occur only between the months of April and October.
- A re-circulation system for drilling surface fluid returns shall be employed to minimize the amount of drilling fluid used. Residual materials separated from the drilling fluid shall be disposed of in accordance with applicable regulations.
- All drilling fluid and fluid additives shall be disclosed, and Material Safety Data Sheets (MSDS) shall be maintained onsite during drilling.
- Excess drilling fluid shall be confined in a containment pit at entry and exit locations until recycled or removed from the site.
- Precautions shall be taken to ensure that drilling fluid does not enter roadways, streams, or any other drainage system or body of water.
- Unintended surfacing of drilling fluid shall be contained at the point of discharge and recycled or removed from the site.

- Drilling fluids that are not recycled and reused shall be removed from the site and disposed of at an approved disposal facility in compliance with all environmental regulations, right-of-ways and workspace agreements, and permit requirements.
- Drilling fluids shall be completely removed from the construction site prior to back filling the open conduit pits.
- Collection, transportation, and disposal of drilling fluids shall be conducted in an environmentally safe method and comply with local ordinances and government conditions. SCE and its contractor shall ensure that all drilling materials and fluids are disposed properly.

HYD-2c Prepare and Implement Frac-out Response Plan. Prior to construction SCE shall prepare a Frac-out Response Plan. The plan shall identify detailed, site-specific procedures to monitor, contain, and clean up a potential frac-out, to avoid introduction of drilling fluids into San Timoteo Creek. Procedures shall include measures to stop work, contain the drilling mud and prevent its further migration into the watercourse, notify all applicable authorities, and clean up and dispose of the drilling mud. The plan shall include, but not be limited to:

- Ensuring all material and equipment needed to contain and clean up drilling mud releases is kept on-site and readily accessible in the event of a frac-out.
- Ensuring clean-up measures do not result in greater damage to the banks and watercourse than from leaving the drilling mud in place.
- Developing a contingency crossing plan including measures to either locate a more appropriate location to re-drill or to isolate the watercourse to complete the crossing at the current location.

HYD-2d Develop and Implement a Groundwater Remediation Plan. SCE shall develop and implement a groundwater remediation plan in the event that groundwater is encountered during Project-related construction activities at the El Casco Substation Site or along the subtransmission route from MP 0 to Maraschino Substation. In the event that unknown groundwater resources are encountered or an unplanned disturbance of known resources occurs, SCE shall immediately halt the disruptive excavation activity and develop and implement a site-specific remediation plan. This remediation plan may require activities such as bioremediation or other applicable technology, as determined appropriate under site-specific conditions.

Impact HYD-3: Degradation of surface water or groundwater quality would result from the accidental release of potentially harmful materials during operational activities (Class III).

Surface and groundwater quality could potentially be impacted during activities associated with the operation and maintenance of the Proposed Project. Potentially harmful materials could be accidentally released during operational or maintenance activities at pole and tower locations, substation sites, and along access roads. Due to the use of vehicles and other motorized equipment, some of the potentially hazardous substances that could be released include diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, and lubricant grease. Transformer oil and other substances associated with transformers could also be accidentally released during operation or maintenance activities. These materials could contaminate surface water through direct release or runoff to local surface waterways.

Groundwater resources could be affected through soil infiltration or through direct runoff, if the groundwater table is exposed due to excavation. As described for Impact HYD-2, above, APM HYDRO-8 would be incorporated into the Project in order to avoid and reduce the impact of accidentally released materials. In contrast with construction activities, which would include greater land disturbance and more invasive activities for the installation of Project facilities, operation of the Proposed Project would include activities with substantially less potential to result in water quality degradation from the accidental spill of hazardous materials. Operational activities would include annual visual inspections of Project facilities by truck, with maintenance performed on an as-needed basis. These activities would not have the potential to cause a significant degradation in water quality from the accidental release of hazardous materials. Therefore, no mitigation measures are recommended for operational and maintenance activities due to the less invasive and less hazardous nature of such activities. Therefore, Impact HYD-3 would be less than significant with no mitigation recommended (Class III).

Impact HYD-4: Disturbance of existing groundwater resources (Class II).

Excavation activities associated with the Proposed Project would consist primarily of drilling for the installation of new transmission line tower foundations and grading for construction of the El Casco Substation. A geotechnical investigation encountered groundwater at shallow levels on and around the El Casco Substation site. A boring drilled at the north end of the proposed substation site, approximately 300 feet from San Timoteo Creek encountered moist soil between 10 and 15 feet below the surface, and wet soil at 15 feet. A boring drilled at the northeast corner of the substation site, approximately 120 feet from San Timoteo Creek encountered moist soil at less than 4 feet and wet at 10 feet. Given this shallow depth to groundwater, ground disturbing activities at the El Casco Substation site have the potential to encounter groundwater. If groundwater is encountered, construction activities would have the potential to degrade water quality through introduction of contaminants such as soils, drilling fluids, and chemicals used during construction.

Construction of the Proposed Project would cause a slight increase in the amount of impermeable surface area, most of which would be 5.3 acres of paved surface at the El Casco Substation site. However, this would not significantly limit groundwater recharge in the area due to the extensive permeable surface in the 125-acre watershed area. Local streamflow would not be altered by the Project such that it would result in a lowering of the local groundwater table. If groundwater resources are unexpectedly encountered during construction, APM HYDRO-4 would ensure that any potential impact would be minimized.

Although the SWPPP would not directly address groundwater resources, it would require specific BMPs regarding construction activities and procedures. These BMPs would minimize any potential impacts to water quality. Implementation of APM HYDRO-4 would help to minimize the potential for Project-related excavation to disturb groundwater. APM HYDRO-4 calls for testing groundwater for contaminants in the event that groundwater is encountered. Additionally the SWPPP that would be prepared for the Project, as well as APMs HYDRO-1, HYDRO-2a, and HYDRO-2c, would address erosion control methods to reduce the transport of potentially contaminating materials to groundwater and APMs HYDRO-2d and HYDRO-8 would require specific hazardous substance control and emergency response procedures to also protect water quality. In order to ensure that potential impacts to groundwater would be less than significant (Class II), implementation of Mitigation Measure HYD-4 (Develop and Implement a Groundwater Remediation Plan) is recommended.

Mitigation Measure for Impact HYD-4

HYD-2d Develop and Implement a Groundwater Remediation Plan

Impact HYD-5: Increased runoff from the creation of new impervious areas (Class III).

The perviousness, or permeability, of a substance refers to the degree to which it allows liquid to pass through it. Impervious surfaces seal the soil surface, eliminating the infiltration of precipitation and natural groundwater recharge. As a result, stormwater washes directly across impervious surfaces, raising flood peaks in the area, which causes erosion of unlined stream channels and increased sediment loads. New impervious surfaces would be introduced during construction of the Proposed Project. In general, the construction or improvement of access roads and spur roads as well as substation sites would introduce permanent impervious areas because they would be maintained throughout the lifetime of the Project in order to complete operational activities. Other new permanent impervious areas include transmission tower pads and any concrete-filled areas. Temporary construction access ways, laydown areas, and marshalling yards would introduce temporary impervious areas because they would be returned to existing conditions (to the extent possible) after completion of Project construction.

Construction would require scraping and grading, as well as installation of concrete foundations and pavement in some areas. These Project features could result in an increase in runoff volumes and rates. However, the amount of the new impervious area at the El Casco Substation site would not substantially increase surface runoff in the Proposed Project area because most of the substation site (10.5 acres of the 14-acre site) would be covered with crushed rock over compacted soil. The crushed rock would be permeable to the subsurface, thus allowing infiltration of surface water.

Scraping and grading for new spur and access roads would remove vegetation and disturb the soil surface, which would result in a reduction in the infiltration and absorption capacity of the impacted area. However, the potential impacts from spur roads and access roads would be localized and temporary. Therefore, this new impervious area introduced through road construction is not expected to substantially increase surface runoff in the Project area.

Another Project feature which would introduce new impervious area is the footings and pads required for transmission towers and other support structures, as well as the Mill Creek antenna tower. Some tower pads would also require grading in order to accommodate construction equipment and tower assembly. At each support structure location, a concrete foundation would be constructed and the use of impervious materials would slightly restrict stormwater infiltration. Each tubular steel pole would require one drilled pier footing with an approximately six- to eight-foot diameter. The new permanent impervious area that would be introduced through these footings would range between 0.00065 and 0.0015 acre each. This new impervious area is small enough in size that it would not have the potential to significantly increase stormwater runoff in the Project area or alter the area's drainage pattern and overall infiltration potential. Therefore, Impact HYD-5 for the Proposed Project would be less than significant with no mitigation recommended (Class III)

Impact HYD-6: Runoff introduced as a result of permanent Project features would cause the overloading of a local stormwater drainage system (Class III).

The Proposed Project would include development of approximately 14 acres of land for construction of the El Casco Substation. This development would result in the installation of some areas of paved concrete or asphalt surfaces, which would potentially increase the quantity of surface water runoff. Additionally, construction of the substation would require the hillside south of the substation to be recontoured and subject to an extensive cut. As described in Section B, Project Description, the Proposed Project includes numerous and detailed measures to direct stormwater flow around the substation site, to dissipate concentrated flows, and measures to reduce contaminants entering the stormwater drainage system and San Timoteo Creek. Such measures include installation of concrete drainage terraces on

slopes, landscaping slopes with native vegetation, routing stormwater into drainage channels, dissipating concentrated flow through vegetated swales and infiltration pits, and other measures. During new equipment installation at Banning and Zanja Substations, BMPs would be implemented to control stormwater runoff to the existing drainage system at the sites. Construction of these improvements would not affect drainage patterns because the alterations would take place within the existing substation areas.

The drainage plan would include rerouting the portion of a not readily identifiable blueline channel that is west of the proposed El Casco Substation location. SCE would improve this rerouted drainage channel to protect the integrity of the substation site and manage runoff to protect water quality in San Timoteo Creek. If rerouting of this channel is necessary, APM HYDRO-2b requires SCE to contact the relevant agencies to determine if a Fish and Game Code Section 1600 Streambed Alteration Agreement from the California Department of Fish and Game would be required.

SCE would also design the site drainage plan in coordination with the County, the RWQCB, and CDFG to minimize effects. Stormwater discharge to San Timoteo Creek would require an NPDES permit. Discharges of sediment and pollutants from runoff during operation could have an adverse impact to water quality in San Timoteo Creek. SCE would implement BMPs and mitigation measures to reduce the effects to less-than-significant levels.

As discussed above for Impact HYD-5, transmission towers and footings and the Mill Creek antenna tower would not substantially increase runoff and would therefore not contribute substantial runoff to the local drainage system. The fiber optic communications systems would be installed on existing poles and in existing conduits, therefore this portion of the Proposed Project would not contribute runoff to the local drainage system. Operation of the facilities at the El Casco Substation site would generally not affect drainage. The final engineering plans and permit applications (SWPPP) would define the site drainage. The drainages would be designed to accommodate site runoff from a 100-year flood event. Therefore impacts related to overloading stormwater drainage systems would be less than significant and no mitigation is recommended (Class III).

Impact HYD-7: Transmission towers or other above-ground project features located in a floodplain or watercourse could result in flooding, flood diversions, or erosion (Class II).

The El Casco Substation site is not located within a FEMA designated 100-year or 500-year flood hazard zones as mapped in Riverside County. Elevations closest to San Timoteo Creek may be within the 500-year flood flow area (SCE, 2007a). Several elements at the El Casco Substation site, such as the access road, driveway, 220 kV loop-in towers, and the 12 kV underground duct banks are located within 150 feet of the creek. Project construction in these areas could be affected by 500-year flows; however, all features would be designed to accommodate the 500-year flow.

SCE would construct the lowest 220 kV tower support structure to elevate the tower above the highest adjacent grade, at least as high as the depth number specified in feet on the Flood Insurance Rate Map (or at least two feet if no depth number is specified); or, site facilities would be flood-proofed to that level so that the structures are watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy.

Construction of improvements at the Banning and Zanja Substations would not alter any streams or other natural drainages and would be designed to minimize the effects to equipment from potential flooding. Neither site is located within a FEMA designated 100-year flood hazard zone, however the Zanja Substation is within a 500-year flood hazard zone.

The proposed subtransmission line route passes over several major drainages; however, pole construction would take place outside the ordinary high water mark of streams and would not impact surface water. Most of the subtransmission portion of the Proposed Project occurs within existing ROW, and access roads are already in existence and are maintained on a regular basis. No new access roads are expected to be required for the subtransmission line, although some grading may be required to reestablish roads if they are not passable by equipment. The proposed pole replacement activities would not alter drainages.

Portions of the subtransmission line route are in locations that are susceptible to flooding when heavy rains occur within steep mountainous areas. These floods can reach high velocities when they reach the valley floor. Drainages and other waterways in the area have the potential to overflow, causing flooding. The drainage areas within the Proposed Project area that are particularly subject to flooding are those in the vicinity of the Smith and Noble Creeks (SCE, 2007a).

The placement of towers in these areas is not expected to cause diversion of flows or increased flood risk for adjacent property. None of the infrastructure associated with the Proposed Project would be situated in a watercourse. However, transmission towers placed near drainages may be susceptible to flooding during heavy rains which could cause erosion-related damage to Project structures, resulting in a significant impact. Although the proposed route does span drainage areas and does have features in close proximity to San Timoteo Creek, towers would be located on nearby hillsides and other land areas, and engineered to withstand any stresses associated with their proximity to drainages. Implementation of the construction standards and approvals required by Mitigation Measure HYD-7 (Aboveground Structures Shall be Protected Against Flood and Erosion Damage), described below, would ensure that any potential impacts of the placement of transmission towers in drainages and potential flood areas would be less than significant. Therefore, Impact HYD-7 for the Proposed Project would be less than significant with mitigation incorporated (Class II).

Mitigation Measure for Impact HYD-7

HYD-7 Aboveground Structures Shall be Protected Against Flood and Erosion Damage. Aboveground Project features such as transmission line towers and substation facilities shall be designed and engineered to withstand any physical and mechanical stresses that may result from location, such as potential flooding or erosion of the surrounding area. Site-specific measures may include tower anchoring, installation of slope protection, or raising foundation levels. All Project-related facilities shall be placed outside the current and reasonably expected future flow path of watercourses. The site shall be designed such that drainage and erosion patterns will not be altered with respect to adjacent properties so as not to induce flooding or erosion damage.

Impact HYD-8: Result in damage from inundation by tsunami, seiche, or mudflow (No Impact).

The Proposed Project would not be located near the coast and would therefore not be subject to any tsunami hazards. A seiche refers to wave events that occur in a lake, reservoir, or harbor as a result of atmospheric or seismic conditions. In seismically active areas, it is likely that minor below-surface seiche events are common, yet unnoticeable from the surface. According to the Earthquake Hazards Program of the United States Geological Survey, the southeastern part of the United States has by far experienced the greatest density of seiches, while the areas west of the Rockies (including California) have experienced few or no seiches (USGS, 2007). Seiches occurrence is influenced by a variety of factors such as thickness of surface sediments, presence of thrust faults, and structural uplifts and basins. The closest enclosed body of water to the Proposed Project is located approximately one mile west and downgradient of the El Casco Substation site and is relatively small (approximately 180,000 square meters). Even if a

seiche were to occur on this water body, any resultant flow would be in a direction away from the Proposed Project. Therefore the Proposed Project would not be subject to seiche hazards.

Mudflow events occur due to a combination of soil type, precipitation, and slope. Mudflow may be triggered by heavy rainfall on steep slopes where the soil is not able to sufficiently drain or absorb. As a result, soil and rock materials become unstable and eventually slide away from their existing location in a mudflow event. Most of the Project route is located along relatively open, flat land that is not at risk of mudflows. The El Casco Substation site and approximately three miles of the subtransmission route would be located on or within hilly terrain. However, the topography of this area is not of sufficient grade to present a substantial risk of mudflow. No impacts would occur.

Impact HYD-9: Expose people or structures to flooding as a result of failure of a levee or dam (No Impact).

Neither construction nor operation and maintenance of the Proposed Project would have the potential to cause the failure of a levee or dam. The Proposed Project features would not be placed within close proximity to a levee or dam or within the inundation area of a dam. The Seven Oaks Dam, located approximately eight miles northeast of Redlands, is the nearest dam to the Proposed Project route and its inundation area does not encompass any portion of the Proposed Project route (City of Highland, 2006). Therefore, people and/or structures would not be exposed to flooding as a result of the failure of a levee or dam. No impact would occur.

D.8.4 CPUC's Northerly Route Alternative Option 3

CPUC's Northerly Route Alternative Option 3 (also referred to as Route Alternative Option 3) subtransmission line route is located within the same general region as the Proposed Project and traverses the same Hydrologic Regions and groundwater basins as the Proposed Project. Construction activities associated with the subtransmission portion of this alternative are primarily focused on two lines, the El Casco-Maraschino line and the El Casco-Banning line. The El Casco-Maraschino line follows the same route to the Maraschino Substation as the Proposed Project route. Therefore the Environmental Setting and Impact Analysis for this portion of the alternative route is identical to that of the Proposed Project and discussion of the Environmental Setting and Impact Analysis for this alternative will primarily focus on the El Casco-Banning portion of the alternative route except where otherwise noted.

D.8.4.1 CPUC's Northerly Route Alternative Option 3 – Environmental Setting

The Route Alternative Option 3 subtransmission line route is located within the Santa Ana River Hydrologic Unit and the Whitewater Hydrologic Unit. As described above for the Proposed Project, the Santa Ana River Hydrologic Unit is under the jurisdiction of the SARWQCB, Region 8 and the CRBRWQCB has jurisdiction over water quality and permitting for the Whitewater Hydrologic Unit.

Surface Water

The surface waters adjacent to or crossed by the El Casco-Banning route include the streams and water bodies shown in Table D.8-5. The surface waters in the Project area are shown in Figure D.8-3. This alternative route would largely drain to existing drainage systems including several creeks, as shown in Table D.8-5. Portions of the alternative route would drain directly into the stormwater drainage systems of the Cities of Beaumont and Banning.

Table D.8-5. Watershed and Drainage Crossings for the CPUC's Northerly Route Alternative Option 3			
Hydrologic Area	Watershed Extent (approximate)	Drainage Crossings	Milepost Extent
San Timoteo	MP 0 to 7.5	San Timoteo Creek	MP 0.25
		Unnamed	MP 2.1
		Unnamed	MP 3.9 to 4.3
		Little San Gorgonio River	MP 4.5
		Noble Creek	MP 5.3
San Jacinto	MP 7.5 to 9.4	Smith Creek	MP 8.3
San Gorgonio	MP 9.4 to 15.5	Montgomery Creek	MP 9.5
		Unnamed	MP 11

Source: SCE, 2007a

Groundwater

Most of the proposed El Casco-Banning subtransmission route (from approximately MP 1 to Banning Substation) is underlain by the Beaumont Storage Unit and Banning Storage Unit. Depth to groundwater within these storage units, as measured in 2004, ranges from 160 to 600 feet bgs (City of Banning, 2005; BCVWD, 2006). Groundwater depths along the El Casco-Maraschino subtransmission route are has high as three feet bgs (SCE, 2007a).

Flooding Potential

Portions of the El Casco-Banning route are in locations that are susceptible to flooding when heavy rains occur within steep mountainous areas. These floods can reach high velocities when they reach the valley floor. Drainages and other waterways in the area have the potential to overflow, causing flooding. The drainage areas within the Project area that are particularly subject to flooding are listed below in Table D.8-6 (SCE, 2007a).

Table D.8-6. Flood Hazards for the CPUC's Northerly Route Alternative Option 3			
Flood Hazard	Watershed	Drainage	Milepost
100-year	San Jacinto	Potrero Creek	MP 6.8
500-year	San Gorgonio	Unnamed	MP 10.8
Unknown	San Gorgonio	Unnamed	MP 11
Unknown	San Gorgonio	Unnamed	MP 11.5

Source: SCE, 2007a

D.8.4.2 CPUC's Northerly Route Alternative Option 3 – Environmental Impacts and Mitigation Measures

Impact HYD-1: Soil erosion and sedimentation caused by construction activities would degrade water quality (Class II).

This alternative route traverses the same types of soils and slopes as the Proposed Project and therefore would have the potential for construction activities, including grading and excavation, to cause slope instability and erosion, as discussed above for the Proposed Project. Construction activities along the length of the alternative route would take place on a variety of gradients, from level ground to a range of slopes. Approximately 40 percent of the soils along the proposed route would have moderate erosion potential. As discussed in Section D.6, Geology and Soils, potential geologic impacts related to slope instability and erosion would be mitigated to less-than-significant levels. If slope stability and erosion were to occur in connection with Project-related construction activities, sediment deposition and

subsequent elevated turbidity could cause a decrease in water quality of waterways in the area of this alternative route, including Smith, Noble, and Montgomery Creeks.

APMs HYDRO-1 (Prohibit grading activities during heavy rains) HYDRO-2a (Develop engineering erosion control and drainage plan), HYDRO-2c (Develop erosion control plan), and HYDRO-7 (Coordinate with appropriate regulatory agencies regarding the location of the access road) would be implemented to reduce construction impacts. In addition, transmission line and substation construction activities would be performed in accordance with the soil erosion/water quality protection measures specified in the Construction SWPPP, which would include BMPs for erosion and sediment control, as well as for construction waste handling and disposal. In addition, as discussed in section D.6, Geology, APM GEO-1 would be implemented to facilitate understanding of site-specific geologic conditions and minimize erosion from construction. Mitigation Measures GEO-1 (Protect Against Slope Instability) and GEO-2 (Minimization of Soil Erosion) would be implemented to strengthen the applicable APM and further reduce potential impacts to water quality from soil erosion. In order to reduce the potential for degradation of water quality from construction-related erosion and sedimentation to a less-than-significant level; additional, specific mitigation measures are recommended, as described below. With the implementation of Mitigation Measures HYD-1a (Implementation of Erosion and Sediment BMPs), HYD-1b (Timing of Construction Activities), HYD-1c (Dispersion of Subsurface Drainage from Slope Construction Areas), and HYD-1d (Control of Side-Cast Material, Right-of-Way Debris, and Roadway Debris), Impact HYD-1 for the Proposed Project would be reduced to a less-than-significant level (Class II).

Mitigation Measures for Impact HYD-1

HYD-1a Implementation of Erosion and Sediment BMPs

HYD-1b Timing of Construction Activities

HYD-1c Dispersion of Subsurface Drainage from Slope Construction Areas

HYD-1d Control of Side-Cast Material, Right-of-Way Debris, and Roadway Debris

GEO-1 Protect Against Slope Instability

GEO-2 Minimize Soil Erosion

Impact HYD-2: Degradation of surface water or groundwater quality would occur from the accidental release of potentially harmful materials during construction activities (Class II).

Surface water and groundwater quality could potentially be impacted during construction activities if any potentially harmful materials are accidentally spilled. This alternative would have similar impacts with regard to accidental releases as described above for the Proposed Project, including those related to frac-out and HDD. Additionally, since groundwater has been encountered at depths as high as three feet bgs at the El Casco Substation site and occurs at unknown depths between the El Casco and Maraschino substations, an accidental release at the site could directly affect water, especially during periods of active excavation and grading. Although the El Casco-Banning Line crosses Smith and Montgomery Creeks farther upstream than the Proposed Project crosses them, the potential for an accidental release to degrade water quality in these streams is the same as the Proposed Project. However, implementation of APMs HYDRO-2a through HYDRO-2d, HYDRO-3 HYDRO-6, and -HYDRO-8, as well as Mitigation Measures HYD-2a (Prevent Frac-out), HYD-2b (Implement HDD BMPs), HYD-2c (Prepare and

Implement Frac-out Response Plan), and HYD-2d (Develop and Implement a Groundwater Remediation Plan), would ensure that impacts to water quality as a result of construction activities are reduced to a less-than-significant level (Class II).

Mitigation Measures for Impact HYD-2

HYD-2a Prevent Frac-out

HYD-2b Implement HDD BMPs

HYD-2c Prepare and Implement Frac-out Response Plan

HYD-2d Develop and Implement a Groundwater Remediation Plan

Impact HYD-3: Degradation of surface water or groundwater quality would result from the accidental release of potentially harmful materials during operational activities (Class III).

As discussed above for the Proposed Project, surface and groundwater quality could potentially be impacted during activities associated with the operation and maintenance of the Route Alternative Option 3. Potentially harmful materials could be accidentally released during operational or maintenance activities at pole and tower locations, substation sites, and along access roads. Vehicles and other motorized equipment could release potentially hazardous substances such as diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, and lubricant grease. Transformer oil and other substances associated with transformers could also be accidentally released during operation or maintenance activities. These materials could contaminate surface water through direct release or runoff to local surface waterways. Groundwater resources could be affected through soil infiltration or through direct runoff, if the groundwater table is exposed due to excavation. As described for Impact HYD-2, above, APM HYDRO-8 would be incorporated into the Project in order to avoid and reduce the impact of accidentally released materials. Operation of this alternative would include activities with substantially less potential to result in water quality degradation from the accidental spill of hazardous materials than construction activities. Operational activities would include annual visual inspections of Project facilities by truck, with maintenance performed on an as-needed basis. These activities would not have the potential to cause a significant degradation in water quality from the accidental release of hazardous materials. Therefore, no mitigation measures are recommended for operational and maintenance activities due to the less invasive and less hazardous nature of such activities. Therefore, Impact HYD-3 would be less than significant with no mitigation recommended (Class III).

Impact HYD-4: Disturbance of existing groundwater resources (Class II).

Excavation activities associated with this alternative would consist primarily of drilling for the installation of new transmission line tower foundations and grading for construction of the El Casco Substation. Impacts at the El Casco Substation would be identical to those described above for the Proposed Project and would be significant without implementation of Mitigation Measure HYD-4 (Develop and Implement a Groundwater Remediation Plan) (Class II). Groundwater along the El Casco-Banning subtransmission route is deeper than 300 feet bgs (City of Banning, 2005), therefore excavation along the route would not encounter groundwater. If groundwater resources are unexpectedly encountered during construction, APM HYDRO-4 would ensure that any potential impact would be minimized.

As discussed above for the Proposed Project, BMPs that would be implemented as a result of the SWPPP would minimize any potential impacts to water quality. Implementation of APM HYDRO-4 would help to

minimize the potential for Project-related excavation to disturb groundwater. Additionally the SWPPP that would be prepared for the Project, as well as APMs HYDRO-1, HYDRO-2a, and HYDRO-2c would address erosion control methods to reduce the transport of potentially contaminating materials to groundwater and APMs HYDRO-2d and HYDRO-8 would require specific hazardous substance control and emergency response procedures to also protect water quality. Despite these APMs, the potential to disturb groundwater at the El Casco Substation site exists; therefore, Mitigation Measure HYD-2d (Develop and Implement a Groundwater Remediation Plan) is recommended to reduce Impact HYD-4 for the Route Alternative Option 3 to a less-than-significant level (Class II).

Mitigation Measure for Impact HYD-4

HYD-2d Develop and Implement a Groundwater Remediation Plan

Impact HYD-5: Increased runoff from the creation of new impervious areas (Class III).

Construction of the Route Alternative Option 3 would involve the same types of construction activities as the Proposed Project. These activities would introduce new impervious surfaces. In general, the construction or improvement of access roads and spur roads as well as substation sites would introduce permanent impervious areas because they would be maintained throughout the lifetime of the Project in order to complete operational activities. Other new permanent impervious areas include transmission tower pads and any concrete-filled areas. Temporary construction access ways, laydown areas, and marshalling yards would introduce temporary impervious areas because they would be returned to existing conditions (to the extent possible) after completion of Project construction.

Scraping and grading for new spur and access roads would remove vegetation and disturb the soil surface, which would result in a temporary reduction in the infiltration and absorption capacity of the impacted area. Construction of footings and pads required for the antenna tower, transmission towers, and other support structures would also result in new impervious surface area. The new permanent impervious area that would be introduced through these footings would range between 0.00065 and 0.0015 acre each, which is small enough in size that it would not have the potential to significantly increase stormwater runoff in the Project area or alter the area's drainage pattern and overall infiltration potential. Therefore, Impact HYD-5 for the Route Alternative Option 3 would be less than significant with no mitigation recommended (Class III)

Impact HYD-6: Runoff introduced as a result of permanent Project features would cause the overloading of a local stormwater drainage system (Class III).

As described for the Proposed Project, this alternative would include the development of approximately 14 acres of land for construction of the El Casco Substation, which would result in the installation of some areas of paved concrete or asphalt surfaces that would potentially increase the quantity of surface water runoff. As described in Section B, Project Description, the Proposed Project includes numerous and detailed measures to direct stormwater flow around the substation site, to dissipate concentrated flows, and measures to reduce contaminants entering the stormwater drainage system and San Timoteo Creek. Such measures include installation of concrete drainage terraces on slopes, landscaping slopes with native vegetation, routing stormwater into drainage channels, dissipating concentrated flow through vegetated swales and infiltration pits and other measures. During new equipment installation, BMPs would be implemented to control stormwater runoff to the existing drainage system at the sites. Construction of these improvements would not affect drainage patterns because the alterations would take place within the existing substation areas.

The drainage plan would include rerouting a portion of a not readily identifiable blueline channel that is west of the substation location. APM HYDRO-2b requires SCE to contact the relevant agencies if rerouting of this channel is necessary to determine if a Section 1600 Streambed Alteration Agreement from the California Department of Fish and Game is required. Additionally, SCE would design the site drainage plan in coordination with the County, the RWQCB, and CDFG to minimize effects. Stormwater discharge to San Timoteo Creek would require an NPDES permit. Discharges of sediment and pollutants from runoff during operation could have an adverse impact to water quality in San Timoteo Creek. SCE would implement BMPs and mitigation measures to reduce the effects to less-than-significant levels.

As discussed above for Impact HYD-5, transmission towers and footings would not substantially increase runoff and would therefore not contribute substantial runoff to the local drainage system. Operation of the facilities at the El Casco Substation site would generally not affect drainage. The final engineering plans and permit applications (SWPPP) would define the site drainage. The drainages would be designed to accommodate site runoff from a 100-year flood event. Therefore impacts related to overloading stormwater drainage systems would be less than significant and no mitigation is recommended (Class III).

Impact HYD-7: Transmission towers or other above-ground project features located in a floodplain or watercourse could result in flooding, flood diversions, or erosion (Class II).

As discussed above for the Proposed Project, the El Casco Substation site is not located within a FEMA designated 100-year or 500-year flood hazard zones as mapped in Riverside County. Project construction in these areas could be affected by 500-year flows; however, all features would be designed to accommodate the 500-year flow. Construction of improvements at the Banning and Zanja Substations would not alter any streams or other natural drainages and would be designed to minimize the effects to equipment from potential flooding. Neither site is located within a FEMA designated 100-year flood hazard zone, however the Zanja Substation is within a 500-year flood hazard zone.

The proposed subtransmission line route passes over several drainages, including the 100-year flood hazard zone of Potrero Creek and the 500-year flood hazard zone of an unnamed drainage in the San Gorgonio Watershed; however, pole construction would take place outside the ordinary high water mark of streams and would not impact surface water. Most of the subtransmission portion of this alternative occurs within existing ROW, and access roads are already in existence and are maintained on a regular basis. The proposed pole replacement activities would not alter drainages.

Portions of the subtransmission line route are in locations that are susceptible to flooding when heavy rains occur within steep mountainous areas. These floods can reach high velocities when they reach the valley floor. Drainages and other waterways in the area have the potential to overflow, causing flooding. The drainage areas within the Route Alternative Option 3 area that are particularly subject to flooding are those in the vicinity of the Smith, Noble, and Montgomery Creeks (SCE, 2007a).

The placement of towers in these areas is not expected to cause diversion of flows or increased flood risk for adjacent property. None of the infrastructure associated with this alternative would be situated in a watercourse. However, transmission towers placed near drainages may be susceptible to flooding during heavy rains which could cause erosion-related damage to Project structures, resulting in a significant impact. Although the proposed route does span drainage areas and does have features in close proximity to San Timoteo Creek, towers would be located on nearby hillsides and other land areas, and engineered to withstand any stresses associated with their proximity to drainages. Implementation of the construction standards and approvals required by Mitigation Measure HYD-7 (Aboveground Structures Shall be Protected Against Flood and Erosion Damage) would ensure that any potential impacts of the placement of transmission towers in drainages and potential flood areas would be less than significant. Therefore,

Impact HYD-7 for the Proposed Project would be less than significant with mitigation incorporated (Class II).

Mitigation Measure for Impact HYD-7

HYD-7 Aboveground Structures Shall be Protected Against Flood and Erosion Damage

Impact HYD-8: Result in damage from inundation by tsunami, seiche, or mudflow (No Impact).

The Route Alternative Option 3 route is located in the same general area as the Proposed Project, which is not located near the coast or large bodies of water. Therefore this would not be subject to any tsunami or seiche hazards. Mudflow events occur due to a combination of soil type, precipitation, and slope. Mudflow may be triggered by heavy rainfall on steep slopes where the soil is not able to sufficiently drain or absorb. As a result, soil and rock materials become unstable and eventually slide away from their existing location in a mudflow event. Most of the Project route is located along relatively open, flat land that is not at risk of mudflows. The El Casco Substation site, approximately three miles of the El Casco-Maraschino subtransmission route, and approximately three miles of the El Casco-Banning subtransmission route would be located on or within hilly terrain. However, the topography of this area is not of sufficient grade to present a substantial risk of mudflow. No impacts would occur.

Impact HYD-9: Expose people or structures to flooding as a result of failure of a levee or dam (No Impact).

Neither construction nor operation and maintenance of the Route Alternative Option 3 would have the potential to cause the failure of a levee or dam. Project features would not be placed within close proximity to a levee or dam or within the inundation area of a dam. The Seven Oaks Dam, located approximately eight miles northeast of Redlands, is the nearest dam to the Project route and its inundation area does not encompass any portion of the proposed alternative (City of Highland, 2006). Therefore, people and/or structures would not be exposed to flooding as a result of the failure of a levee or dam. No impact would occur.

D.8.5 Partial Underground Alternative

The Partial Underground Alternative is identical to the Proposed Project except under this alternative, a one-mile segment of the transmission line, from approximately MP 9.0 to MP 10.0, would be installed underground.

D.8.5.1 Partial Underground Alternative – Environmental Setting

The environmental setting for this alternative is identical to that of the Proposed Project, which is described above in Section D.8.1.

D.8.5.2 Partial Underground Alternative – Environmental Impacts and Mitigation Measures

Since the Partial Underground Alternative is identical to the Proposed Project except for the one-mile segment through the Sun Lakes Community, all of the impacts identified in Section D.8.3.3 for the Proposed Project would also occur under this alternative. Therefore the impact analysis will focus on impacts related to the one-mile segment that would be installed underground.

Impact HYD-1: Soil erosion and sedimentation caused by construction activities would degrade water quality (Class II).

Like the Proposed Project, construction activities of the Partial Underground Alternative would have the potential to cause slope instability and erosion. Excavation and trenching activities required to install the underground segment of this alternative would be much more intensive and of substantially longer duration (10 months for the underground segment) than that of the above ground portions of the subtransmission route. These activities would result in areas of exposed and stockpiled soil that would be subject to potential erosion for a longer period of time than the Proposed Project. Although there are no natural watercourses or drainages located along this portion of the route, drainage from the construction area would run into the sewer system within the roads of the Sun Lakes Community, which would ultimately travel downstream to other drainages within the watershed. If slope instability and erosion were to occur in connection with Project-related construction activities, sediment deposition and subsequent elevated turbidity could cause a decrease in downstream waterways, resulting in a significant impact.

As discussed above for the Proposed Project, these impacts would be reduced to less than significant (Class II) with implementation of APMs HYDRO-1, HYDRO-2a, HYDRO-2c, HYDRO-7, GEO-1, GEO-2, and Mitigation Measures GEO-1 (Protect Against Slope Instability), GEO-2 (Minimization of Soil Erosion), HYD-1a (Implementation of Erosion and Sediment BMPs), HYD-1b (Timing of Construction Activities), HYD-1c (Dispersion of Subsurface Drainage from Slope Construction Areas), and HYD-1d (Control of Side-Cast Material, Right-of-Way Debris, and Roadway Debris).

Mitigation Measures for Impact HYD-1

HYD-1a Implementation of Erosion and Sediment BMPs

HYD-1b Timing of Construction Activities

HYD-1c Dispersion of Subsurface Drainage from Slope Construction Areas

HYD-1d Control of Side-Cast Material, Right-of-Way Debris, and Roadway Debris

GEO-1 Protect Against Slope Instability

GEO-2 Minimize Soil Erosion

Impact HYD-2: Degradation of surface water or groundwater quality would occur from the accidental release of potentially harmful materials during construction activities (Class II).

The potential for the Partial Underground Alternative to degrade surface water quality as a result of accidental releases of hazardous materials would be similar to that presented above for the Proposed Project. However, the duration over which this impact could occur would be 10 months longer than that of the Proposed Project. Installation of underground infrastructure is highly invasive and could potentially result in disturbance of the underlying groundwater. However, this segment is located within the Beaumont Storage Unit. Groundwater depths within this unit range from 160 feet to 600 feet bgs. The total depth of excavation for placement of underground infrastructure is approximately eight feet. In addition, a buried high-pressure gas line is already located in this ROW. Therefore, it is extremely unlikely that groundwater would be encountered during construction activities. If groundwater resources are encountered during construction, APM HYDRO-4 would ensure that any potential impact would be minimized. Additionally, since groundwater has been encountered at depths as high as three feet at the El Casco Substation site and occurs at unknown depths between the El Casco and Maraschino substations, an

accidental release at the site could directly affect water, especially during periods of active excavation and grading.

This alternative would have identical impacts with regard to potential water quality degradation from frac-out and HDD at the El Casco Substation site, as well as within the watercourses and drainages crossed by the overhead subtransmission line. However, as discussed above for Impact HYD-2 for the Proposed Project, implementation of APMs HYDRO-2a through HYDRO-2d, HYDRO-3 HYDRO-6, and -HYDRO-8, as well as Mitigation Measures HYD-2a (Prevent Frac-out), HYD-2b (Implement HDD BMPs), HYD-2c (Prepare and Implement Frac-out Response Plan), and HYD-2d (Develop and Implement a Groundwater Remediation Plan), would ensure that impacts to water quality as a result of construction activities are reduced to a less-than-significant level (Class II).

Mitigation Measures for Impact HYD-2

HYD-2a Prevent Frac-out

HYD-2b Implement HDD BMPs

HYD-2c Prepare and Implement Frac-out Response Plan

HYD-2d Develop and Implement a Groundwater Remediation Plan

Impact HYD-3: Degradation of surface water or groundwater quality would result from the accidental release of potentially harmful materials during operational activities (Class III).

Impacts related to degradation of surface water or groundwater quality from the accidental release of potentially harmful materials during operation of this alternative would be identical to those of the Proposed Project. Potentially harmful materials could be accidentally released during operational or maintenance activities at pole and tower locations, substation sites, and along access roads by releases from vehicles and other motorized equipment. Groundwater resources could be affected through soil infiltration or through direct runoff, if the groundwater table is exposed due to excavation along the underground portion of the route; however, APM HYDRO-8 would be incorporated into the Project to avoid and reduce the impact of accidentally released materials. Operational activities would include annual visual inspections of Project facilities by truck, with maintenance performed on an as-needed basis. These activities would not have the potential to cause a significant degradation in water quality from the accidental release of hazardous materials. Therefore, no mitigation measures are recommended for operational and maintenance activities due to the less invasive and less hazardous nature of such activities. Therefore, Impact HYD-3 would be less than significant with no mitigation recommended (Class III).

Impact HYD-4: Disturbance of existing groundwater resources (Class II).

As discussed above for the Proposed Project, excavation activities at the El Casco Substation would require implementation of Mitigation Measure HYD-4 (Develop and Implement a Groundwater Remediation Plan) and APM HYDRO-4 to ensure impacts to groundwater resources would be less than significant (Class II). Groundwater in the City of Banning (where the underground portion of this alternative is located) ranges from 8 to 300 feet bgs (City of Banning, 2006). Excavation and trenching required for installation of the underground portion of this alternative also has the potential to disturb groundwater. If groundwater resources are unexpectedly encountered during construction, APM HYDRO-4 would ensure that any potential impact would be minimized.

Installation of underground infrastructure is highly invasive and could potentially result in disturbance of the underlying groundwater. However, this segment is located within the Beaumont Storage Unit. Groundwater depths within this unit range from 160 feet to 600 feet bgs. The total depth of excavation for placement of underground infrastructure is approximately eight feet. Therefore, it is extremely unlikely that groundwater would be encountered during construction activities. If groundwater resources are encountered during construction, APM HYDRO-4 would ensure that any potential impact would be minimized. Additionally, since groundwater has been encountered at depths as high as three feet at the El Casco Substation site and occurs at unknown depths between the El Casco and Maraschino substations, an accidental release at the site could directly affect water, especially during periods of active excavation and grading.

As discussed above for the Proposed Project, BMPs that would be implemented as a result of the SWPPP would minimize any potential impacts to water quality. Implementation of APM HYDRO-4 would help to minimize the potential for Project-related excavation to disturb groundwater. Additionally the SWPPP that would be prepared for the Project, as well as APMs HYDRO-1, HYDRO-2a, and HYDRO-2c would address erosion control methods to reduce the transport of potentially contaminating materials to groundwater and APMs HYDRO-2d and HYDRO-8 would require specific hazardous substance control and emergency response procedures to also protect water quality. Despite these APMs, the potential to disturb groundwater exists; therefore, Mitigation Measure HYD-2d (Develop and Implement a Groundwater Remediation Plan) is recommended to reduce Impact HYD-4 for the Partial Underground Alternative to a less-than-significant level (Class II).

Mitigation Measure for Impact HYD-4

HYD-2d Develop and Implement a Groundwater Remediation Plan.

Impact HYD-5: Increased runoff from the creation of new impervious areas (Class III).

As discussed above for the Proposed Project, the Partial Underground Alternative would introduce some new, permanent impervious areas that are expected to cause a less-than-significant increase in surface water runoff. Installation of underground infrastructure would involve placement of two adjacent concrete duct banks underground along a one-mile segment of the subtransmission route. Each duct bank would be approximately two feet wide and they would be located side by side. The existing ground cover would also be affected by this alternative due to vegetation removal and soil compaction. During construction of underground facilities, a four-foot-wide swath would be cleared to install each of the two duct banks that would house the underground cables. Existing vegetation would be removed and the entire area would be subject to soil compaction from use of construction equipment. However, after Project construction, the existing ground cover would not change from pre-construction conditions. The Partial Underground Alternative would therefore be the same as the Proposed Project with regard to the potential to increase runoff. Therefore, Impact HYD-5 for the Partial Underground Alternative would be less than significant with no mitigation recommended (Class III)

Impact HYD-6: Runoff introduced as a result of permanent Project features would cause the overloading of a local stormwater drainage system (Class III).

As discussed above for Impact HYD-5, the Partial Underground Alternative would introduce some new, permanent impervious areas that are expected to cause a less-than-significant increase in surface water runoff. Therefore, overloading of the local stormwater drainage system within the Sun Lakes Community is not expected. Impacts for the rest of this alternative route would be identical to the less-than-significant

impacts (Class III) described above for the Proposed Project under Impact HYD-6, and no mitigation measures are required.

Impact HYD-7: Transmission towers or other above-ground project features located in a floodplain or watercourse could result in flooding, flood diversions, or erosion (Class II).

The underground portion of the Partial Underground Alternative is not located within a floodplain or watercourse. Additionally, Project structures along this segment would be located underground and would not have the potential to divert flood flows. Therefore this segment of the Partial Underground Alternative would have no impact with regard to causing flood diversion or erosion. Impacts for the rest of this alternative route would be identical to those described for the Proposed Project under Impact HYD-7 and would require implementation of Mitigation Measure HYD-7 (Aboveground Structures Shall be Protected Against Flood and Erosion Damage), to reduce impacts to a less-than-significant level (Class II).

Mitigation Measure for Impact HYD-7

HYD-7 Aboveground Structures Shall be Protected Against Flood and Erosion Damage

Impact HYD-8: Result in damage from inundation by tsunami, seiche, or mudflow (No Impact).

The Partial Underground Alternative route is located in the same area as the Proposed Project, which is not located near the coast or large bodies of water. Therefore this alternative would not be subject to any tsunami or seiche hazards. Mudflow events occur due to a combination of soil type, precipitation, and slope. Mudflow may be triggered by heavy rainfall on steep slopes where the soil is not able to sufficiently drain or absorb. As a result, soil and rock materials become unstable and eventually slide away from their existing location in a mudflow event. Most of the Partial Underground Alternative route is located along relatively open, flat land that is not at risk of mudflows. The El Casco Substation site, approximately three miles of the El Casco-Maraschino subtransmission route, and approximately three miles of the El Casco-Banning subtransmission route would be located on or within hilly terrain. However, the topography of this area is not of sufficient grade to present a substantial risk of mudflow. No impacts would occur.

Impact HYD-9: Expose people or structures to flooding as a result of failure of a levee or dam (No Impact).

Neither construction nor operation and maintenance of the Partial Underground Alternative would have the potential to cause the failure of a levee or dam. Project features would not be placed within close proximity to a levee or dam or within the inundation area of a dam. The Seven Oaks Dam, located approximately eight miles northeast of Redlands, is the nearest dam to the Project route and its inundation area does not encompass any portion of the proposed alternative (City of Highland, 2006). Therefore, people and/or structures would not be exposed to flooding as a result of the failure of a levee or dam. No impact would occur.

D.8.6 No Project Alternative

Under the No Project Alternative, neither the Proposed Project nor the alternatives would be built and none of the impacts described above would occur. However, without the Proposed Project, overload of the existing capacities would occur at five distribution stations that are currently served by the Vista and Devers 115 kV Systems. To address the overload conditions in the Maraschino service area, SCE would add a third transformer and two 12 kV distribution lines (each about nine miles in length).

D.8.6.1 Environmental Impacts of the No Project Alternative

Although it is currently unknown where the 12 kV distribution lines would be constructed, it can be reasonably assumed that construction of these lines would result in similar impacts as the Proposed Project. Any construction activities that require grading and excavation would have the potential to degrade surface water quality through accidental releases of hazardous material if such activities are located near or within a drainage or watercourse. Based on the depth to groundwater within this area, groundwater is not likely to be disturbed. Construction of distribution lines would also not be expected to result in a substantial amount of new impervious area such that runoff would be increased enough to overload existing drainage systems. Additionally, like the Proposed Project, construction of 12 kV distribution lines would have no impacts with regard to tsunamis, seiches, mudflow, or dam or levee failure.

D.8.7 Mitigation Monitoring, Compliance, and Reporting Table

Table D.8-7 on the following page presents the mitigation monitoring recommendations for Hydrology and Water Quality. These measures along with Applicant Proposed Measures HYDRO-1 through Hydro-8 would be applicable to construction and operation of the proposed route and all alternative route segments.

Table D.8-7. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Impact HYD-1: Soil erosion and sedimentation caused by construction activities would degrade water quality (Class II).	HYD-1a: Implementation of Erosion and Sediment BMPs. The following BMPs shall be implemented in order to minimize potential hydrologic and water quality impacts of erosion and sedimentation created through Project construction: • Mechanical and vegetative measures shall be implemented to provide surface soil stability where necessary. Mechanical measures may include but are not limited to: wattles, erosion nets, terraces, side drains, blankets, mats, riprapping, mulch, tackifiers, pavement, soil seals, and windrowing construction slash at the toe of fill slopes. Vegetative measures shall be used to supplement mechanical measures, as appropriate. • Road slope stabilization practices shall be implemented prior to the first winter rains. These practices shall include: verification of the correct slope steepness as dependent upon the dominant soil type/s present, implementation of methods to handle surface and subsurface runoff, and finalization of road surface compaction or application of appropriate surfacing material. • Any temporary roadways which are built or used for the purpose of transporting construction equipment and materials to construction sites shall be situated to prevent undercutting of the designated final cut slope, avoid deposition of materials outside the designated roadway limits, and accommodate drainage with temporary culverts as necessary. • Embankment methods shall be implemented to ensure adequate strength of the roadway and shoulder and to minimize potential failure of road embankments and fill areas. Acceptable stabilization methods include: sidecasting and end dumping, layer placement (roller compaction), controlled compaction, minimization of fill volumes, or strengthening of fills using retaining walls, confinement systems, plantings, or a combination of techniques. The appropriate stabilization effort shall be determined by the supervising project or crew leader prior to the onset of construction, based on site-specific	Areas having moderate to high erosion potential and anywhere grading occurs.	CPUC-approved engineer shall review and approve erosion control plans.	Plan/remediation prevents erosion and sedimentation from degrading water quality.	CPUC, CRBRWQCB, SARWQCB	Prior to and during construction

Table D.8-7. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	conditions. • Strictly control vehicular traffic to only that which is necessary. • Restore temporary construction areas (e.g., temporary roads, pulling and splicing stations) to a near-natural condition and ensure that the sites are re-vegetated and stabilized, unless operation and maintenance of the Project would require the areas to remain clear. • Establish the use of concrete washout stations to capture and contain concrete washout material and wastewater to avoid direct release of washout to surface water. • Erosion control measures shall be completed prior to the first anticipated rains at all construction sites. An Erosion Control Plan shall be prepared as part of the Project SWPPP.					
	HYD-1b: Timing of Construction Activities. Construction activities, particularly regarding roadway installations and improvements, must occur during the dry season (April to October) or when precipitation events are not expected.	Entire Project	Onsite monitor will verify that no construction occurs during periods of heavy rain.	Remediation prevents erosion and sedimentation from degrading water quality.	CPUC	During construction
	HYD-1c: Dispersion of Subsurface Drainage from Slope Construction Areas. In order to minimize sediment production from the potential failure of slope construction areas, subsurface drainage devices shall be implemented where necessary, as determined during final siting and engineering of transmission towers. Where it is determined necessary due to site-specific conditions such as slope severity, soil condition, precipitation levels, and inherent instability, subsurface drainage will be utilized to avoid moisture saturation and potential subsequent slope failure. Subsurface dispersion methods would include underdrains or subdrains such as pipes, horizontal drains, or chimney drains.	Any location with the potential for slope failure	CPUC-approved engineer shall review and approve construction plans, including the report that will document the investigations and provide the support and protection measures.	Remediation prevents erosion and sedimentation from degrading water quality.	CPUC	Prior to and during construction
	HYD-1d: Control of Side-Cast Material, Right-of-Way Debris, and Roadway Debris . Side-cast material includes any loose, unconsolidated materials that must be re-located to facilitate	Entire Project	Onsite monitor will verify proper handling and disposal of side-cast material and debris.	Remediation prevents erosion and sedimentation from degrading water	CPUC	Prior to and during construction

Table D.8-7. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	construction activities. This may include rocks and boulders as well as organic materials. Prior to the onset of any construction activities, waste areas must be designated where excess material can be deposited and stabilized. During road construction and maintenance, potential sidecast and other waste material will be utilized on the road surface. Any unused material shall be removed to designated disposal sites. Waste areas shall not be left exposed and must be transported to disposal facilities on a regular basis, which will be determined based on site-specific conditions.			quality.		
	GEO-1: Protect Against Slope Instability. Appropriate support and protection measures shall be implemented to maintain the stability of excavations and protect surrounding structures and utilities to limit ground deformation. Design-level geotechnical investigations shall be performed to evaluate subsurface conditions, identify potential hazards, and provide information for development of excavation plans and procedures. Based on the results of the geotechnical investigations, appropriate support and protection measures shall be designed and implemented to maintain the stability of slopes adjacent to newly graded or re-graded access roads and work areas during and after construction. These measures shall include, but are not limited to, retaining walls, visqueen, removal of unstable materials, and avoidance of highly unstable areas. SCE shall document compliance with this measure prior to the start of construction by submitting a report to the CPUC for review and approval. The report shall document the investigations and detail the specific support and protection measures that will be implemented.	Areas where surface units are not coherent enough to support themselves during excavation	CPUC-approved engineer shall review and approve construction plans, including the report that will document the investigations and provide the support and protection measures	Plan/ remediation prevents collapse of excavations and risk or injury to workers to the extent feasible	CPUC, local planning agencies	Prior to construction. Could be staged to stay ahead of construction at particular site
	GEO-2: Minimize Soil Erosion. The Construction SWPPP for the Project shall include BMPs designed to minimize soil erosion along access roads and at work areas. Appropriate BMPs may include construction of water bars, grading road surfaces to direct flow away from natural slopes, use of soil stabilizers, and consistent maintenance of roads and culverts to maintain appropriate flow paths. Silt	Areas having soils that are loosely compacted such as along the Maraschino Loop South, much of the subtransmission line route, and in	CPUC-approved engineer shall review and approve construction plans	Plan/ remediation prevents failure of tower footings to the extent feasible	CPUC, local planning agencies	Prior to construction. Could be staged to stay ahead of construction at particular

Table D.8-7. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	fences and straw bales installed during construction shall be removed to restore natural drainage during the cleanup and restoration phase of the Proposed Project. Where access roads cross streams or drainages, they shall be built at or close to right angles to the streambeds and washes and culverts or rock crossings shall be used to cross streambeds and washes. Design of appropriate BMPs should be conducted by or under the direction of a qualified geologist or engineer.	patches on hillsides				site
	APM HYDRO-1: Grading activities shall not be performed during heavy rains.	El Casco Substation site	Onsite monitor will verify that no construction occurs during periods of heavy rain.	Remediation prevents erosion and sedimentation from degrading water quality.	CPUC	During construction
	APM HYDRO-2a: An engineering erosion control plan shall be developed as part of the site grading plan.	El Casco Substation site	CPUC-approved engineer shall review and approve erosion control plans.	Plan/remediation prevents erosion and sedimentation from degrading water quality.	CPUC, SARWQCB	Prior to and during construction
	APM HYDRO-2c: Develop erosion control plan.	Entire Project	CPUC-approved engineer shall review and approve erosion control plans.	Plan/remediation prevents erosion and sedimentation from degrading water quality.	CPUC, CRBRWQCB, SARWQCB	Prior to and during construction
	APM HYDRO-7: Consult with agencies regarding road relocation.	Access road to proposed El Casco Substation	CPUC-approved engineer shall review and approve relocation plans for proposed access road and documentation of consultation with Riverside County, CDFG, and the SARWQCB. Onsite monitor will verify successful restoration of existing access road after completion of proposed access road.	Plan/remediation prevents erosion and sedimentation from degrading water quality. Existing access road is satisfactorily restored.	CPUC, Riverside County, CDFG, and the SARWQCB	Prior to final engineering of the proposed access road
	APM GEO-1: Perform geotechnical investigation of slope stability and geologic conditions.	Areas where surface units are not coherent enough to support	CPUC-approved engineer shall review and approve construction plans, including the report that will document	Plan/ remediation prevents collapse of excavations and risk or injury to workers to	CPUC, local planning agencies	Prior to construction. Could be staged to

Table D.8-7. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
		themselves during excavation	the investigations and provide the support and protection measures	the extent feasible		stay ahead of construction at particular site
Impact HYD-2: Degradation of surface water or groundwater quality would occur from the accidental release of potentially harmful materials during construction activities (Class II).	HYD-2a: Prevent Frac-out. SCE's HDD contractor shall take the following precautions to prevent frac-out from occurring during drilling activities: • Ensure that HDD casings are drilled to a depth of at least eight (8) feet below the bottom of San Timoteo Creek. • Ensure HDD machinery arrives onsite in clean condition and is free of fluid leaks. • Wash, refuel, and service machinery and store fuel and other materials for the machinery at least 50 feet away from San Timoteo Creek to prevent any hazardous substances from entering the water. • Keep emergency spill kits on site in case of fluid leaks or spills from machinery. • Restore banks to original condition if any disturbance occurs. • Ensure drilling mud, sediment-laden water, and any other deleterious substances are contained above the high water mark and do not enter San Timoteo Creek. • Dispose of excess drilling mud, cuttings, and other waste materials at an adequately sized disposal facility located at least 50 feet away from San Timoteo Creek to prevent it from entering the watercourse. • Monitor San Timoteo Creek to observe signs of surface migration (frac-out) of drilling mud during all phases of construction.	Location of HDD activities at the proposed El Casco Substation site	CPUC-approved engineer shall review and approve plans.	Plan/remediation prevents construction-related hazardous materials from degrading water quality.	CPUC, CRBRWQCB, SARWQCB	Prepare plans prior to construction and implement during construction
	HYD-2b: Implement HDD BMPs. SCE's HDD contractor shall implement BMPs during HDD activities to prevent water quality degradation. These measures shall include, but not be limited to: • Perform all HDD activities outside of the rainy season (November to March). HDD activities shall be scheduled to occur only between the months of	Location of HDD activities at the proposed El Casco Substation site	CPUC-approved engineer shall review and approve plans. Onsite monitor shall verify compliance with all BMPs.	Plan/remediation prevents construction-related hazardous materials from degrading water quality.	CPUC, CRBRWQCB, SARWQCB	Prepare plans prior to construction and implement during

Table D.8-7. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	April and October. • A re-circulation system for drilling surface fluid returns shall be employed to minimize the amount of drilling fluid used. Residual materials separated from the drilling fluid shall be disposed of in accordance with applicable regulations. • All drilling fluid and fluid additives shall be disclosed, and Material Safety Data Sheets (MSDS) shall be maintained onsite during drilling. • Excess drilling fluid shall be confined in a containment pit at entry and exit locations until recycled or removed from the site. • Precautions shall be taken to ensure that drilling fluid does not enter roadways, streams, or any other drainage system or body of water. • Unintended surfacing of drilling fluid shall be contained at the point of discharge and recycled or removed from the site. • Drilling fluids that are not recycled and reused shall be removed from the site and disposed of at an approved disposal facility in compliance with all environmental regulations, right-of-ways and workspace agreements, and permit requirements. • Drilling fluids shall be completely removed from the construction site prior to back filling the open conduit pits. • Collection, transportation, and disposal of drilling fluids shall be conducted in an environmentally safe method and comply with local ordinances and government conditions SCE and its contractor shall ensure that all drilling materials and fluids are disposed properly.					construction
	HYD-2c: Prepare and Implement Frac-out Response Plan. Prior to construction SCE shall prepare a Frac-out Response Plan. The plan shall identify detailed, site-specific procedures to monitor, contain, and clean up a potential frac-out, to avoid introduction of drilling fluids into San Timoteo Creek. Procedures shall include measures to stop work, contain the drilling mud and prevent its further migration into the watercourse, notify all applicable	Location of HDD activities at the proposed El Casco Substation site	CPUC-approved engineer shall review and approve plans.	Plan/remediation prevents construction-related hazardous materials from degrading water quality.	CPUC,	Prepare plans prior to construction and implement during construction

Table D.8-7. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	authorities, and clean up and dispose of the drilling mud The plan shall include, but not be limited to: • Ensuring all material and equipment needed to contain and clean up drilling mud releases is kept on-site and readily accessible in the event of a frac-out. • Ensuring clean-up measures do not result in greater damage to the banks and watercourse than from leaving the drilling mud in place. • Developing a contingency crossing plan including measures to either locate a more appropriate location to re-drill or to isolate the watercourse to complete the crossing at the current location.					
	HYD-2d: Develop and Implement a Groundwater Remediation Plan. SCE shall develop and implement a groundwater remediation plan in the event that groundwater is encountered during Project-related construction activities at the El Casco Substation Site or along the subtransmission route from MP 0 to Maraschino Substation. In the event that unknown groundwater resources are encountered or an unplanned disturbance of known resources occurs, SCE shall immediately halt the disruptive excavation activity and develop and implement a site-specific remediation plan. This remediation plan may require activities such as bioremediation or other applicable technology, as determined appropriate under site-specific conditions.	Entire Project	CPUC approved engineer shall review and approve plans.	Plan/remediation prevents construction-related hazardous materials from degrading water quality.	CPUC, CRBRWQCB, SARWQCB	Prepare plans prior to construction and implement during construction
	APM HYDRO-2a: An engineering erosion control plan shall be developed as part of the site grading plan.	El Casco Substation	CPUC-approved engineer shall review and approve erosion control plans.	Plan/remediation prevents erosion and sedimentation from degrading water quality.	CPUC, SARWQCB	Prior to and during construction
	APM HYDRO-2b: Coordinate with DWR, CDFG, and FEMA if construction requires alteration or relocation of a watercourse and maintain the flood carrying capacity of the altered stream.	Any location where Project construction would alter or relocate a watercourse	CPUC-approved engineer shall review and approve plans for maintaining flood carrying capacity in any watercourse that would be	Flood-carrying capacity is maintained in any watercourse that is altered or relocated	CPUC, local jurisdictions, DWR, CDFG, and FEMA	Prepare plans prior to construction and implement

Table D.8-7. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
			altered or relocated during Project construction. In the event that a watercourse would be altered or relocated, CPUc shall review documentation of coordination with adjacent communities, DWR, CDFG, and FEMA.	during Project construction		during construction
	APM HYDRO-2c: Develop erosion control plan incorporating construction-phase	Entire Project	CPUC-approved engineer shall review and approve erosion control plans.	Plan/remediation prevents erosion and sedimentation from degrading water quality.	CPUC, CRBRWQCB, SARWQCB	Prior to and during construction
	APM HYDRO-2d: Establish environmental training program.	Entire Project	Review and approve environmental training program. Onsite monitor will verify compliance with program.	Minimize exposure of workers or the public to releases of hazardous materials. Prevent release of hazardous materials to water resources.	CPUC	Prepare program and train personnel prior to construction and monitor compliance during construction
	APM HYDRO-6: Provide HDD contractor with copies of all applicable mitigation measures and permit conditions.	Location of HDD activities at the proposed El Casco Substation site	Review documentation that contractor received and agreed to comply with all applicable mitigation measures and permit conditions.	HDD contractor compliance with all applicable mitigation measures and permit conditions	CPUC	Prior to construction
	APM HYDRO-8: Prepare a Hazardous Substance Control and Emergency Response Plan.	Entire Project	CPUC-approved engineer shall review and approve Hazardous Substance Control and Emergency Response Plan.	Minimize exposure of workers or the public to releases of hazardous materials. Prevent release of hazardous materials to water resources.	CPUC	Prior to construction

Table D.8-7. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Impact HYD-4: Disturbance of existing groundwater resources (Class II)	HYD-2d: Develop and Implement a Groundwater Remediation Plan	Entire Project	CPUC-approved engineer shall review and approve plans.	Plan/remediation prevents construction-related hazardous materials from degrading water quality.	CPUC, CRBRWQCB, SARWQCB	Prepare plans prior to construction and implement during construction
	APM HYDRO-1: Grading activities shall not be performed during heavy rains.	El Casco Substation site	Onsite monitor will verify that no construction occurs during periods of heavy rain.	Remediation prevents erosion and sedimentation from degrading water quality.	CPUC	During construction
	APM HYDRO-2a: An engineering erosion control plan shall be developed as part of the site grading plan.	El Casco Substation site	CPUC-approved engineer shall review and approve erosion control plans.	Plan/remediation prevents erosion and sedimentation from degrading water quality.	CPUC, SARWQCB	Prior to and during construction
	APM HYDRO-2c: Develop erosion control plan	Entire Project	CPUC-approved engineer shall review and approve erosion control plans.	Plan/remediation prevents erosion and sedimentation from degrading water quality.	CPUC, CRBRWQCB, SARWQCB	Prior to and during construction
	APM HYDRO-2d: Establish environmental training program.	Entire Project	Review and approve environmental training program. Onsite monitor will verify compliance with program.	Minimize exposure of workers or the public to releases of hazardous materials. Prevent release of hazardous materials to water resources.	CPUC	Prepare program and train personnel prior to construction and monitor compliance during construction
	APM HYDRO-8: Prepare a Hazardous Substance Control and Emergency Response Plan.	Entire Project	CPUC-approved engineer shall review and approve Hazardous Substance Control and Emergency Response Plan.	Minimize exposure of workers or the public to releases of hazardous materials. Prevent release of hazardous materials to water resources.	CPUC	Prior to construction

Table D.8-7. Mitigation Monitoring Program – Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Impact HYD-7: Flood hazards created through the placement of permanent aboveground structures in a flood hazard area, a floodplain, or a watercourse (Class II).	HYD-7: Aboveground Structures Shall be Protected Against Flood and Erosion Damage. Aboveground Project features such as transmission line towers and substation facilities shall be designed and engineered to withstand any physical and mechanical stresses that may result from location, such as potential flooding or erosion of the surrounding area. Site-specific measures may include tower anchoring, installation of slope protection, or raising foundation levels. All Project-related facilities shall be placed outside the current and reasonably expected future flow path of watercourses. No Project-related facilities shall be positioned within a known watercourse.	Portions of the subtransmission route that are subject to flood flows	CPUC-approved engineer shall review and approve plans.	Aboveground Project features shall withstand physical and mechanical stresses resulting from flood flows, and shall not be placed within a known watercourse	CPUC	Prior to construction