6. Alternative 2 (SCE's Proposed Project): Impacts and Mitigation Measures

6.1 Direct and Indirect Effects Analysis

The following section describes potential direct and indirect impacts related to Hydrology and Water Quality impacts for Alternative 2 (SCE's Proposed Project), as determined by the significance criteria listed in Section 4.1. Mitigation measures are introduced where necessary in order to reduce significant impacts to less-than-significant levels.

Water Quality Violations, Waste Discharges, or Polluted Runoff (Criterion HYD1)

Impact H-1: Construction activities would degrade surface water quality through erosion and accelerated sedimentation.

Construction and/or demolition of overhead transmission line towers and construction and/or upgrades of substations would require several types of soil disturbance that could subsequently cause localized, short-term water quality degradation. Excavation and/or grading would be required at all tower sites where new pads or footings would be required, at all tower demolition sites, and at all new and/or expanded substations. Additional clearing of vegetation and/or grading would be required for crane pads, pulling/stringing stations, staging areas, marshalling yards, concrete batch plants, helicopter staging areas, helicopter landing pads, tower wreck-out staging areas, and access and spur roads. Disturbance of soil during construction and/or demolition could result in soil erosion and temporarily lowered water quality through increased turbidity and accelerated sediment deposition into local streams. In particular, road construction for both temporary and permanent roadways has the potential to cause soil instability resulting in accelerated erosion and sedimentation, which could temporarily degrade surrounding water quality. Road construction and improvements may involve road widening up to 16 feet (SCE, 2007), and would produce large amounts of loose and disturbed soil, which, without proper management, could enter nearby streams. The water quality impact of road construction and improvement is of particular concern when that road crosses a stream channel, closely parallels a stream channel, or traverses a steep slope. In steep terrain, existing unpaved roads within the Project area show extensive evidence of overland flow, such as rills and gullies that run across and parallel to the roadways. Soil disturbance on these steep, unpaved roads would create a high potential for accelerated erosion. Land disturbance associated with road construction and improvements would include the following activities: removal of vegetation, blade grading, soil compaction, installation of drainage structures and stream crossings, installation of footings and foundations, and installation of slope-strengthening structures as needed. These activities involve soil disturbance and stockpiling of earth, which, without proper management, could wash into surrounding waterways. Construction of any type of stream crossing through an actively flowing stream channel would cause some amount of unavoidable, temporary, localized sedimentation. This impact would apply to all stream crossings along the route, including those presented in Tables 2.3-1, 2.3-2, and 2.3-3, as well as streams crossed by access and spur roads that are identified in the *Riparian Conservation Area Report* (Aspen, 2008).

Northern Region

The potential for localized, short-term degradation of surface water quality through erosion and sedimentation would be low to moderate within the Northern Region. The majority of the soil disturbance

in the Northern Region would occur on very flat ground, which reduces the potential for erosion compared to soil disturbance on steeply sloped topography. Most streams crossed by the proposed Project within the Northern Region are dry except during infrequent periods of brief rainfall with sufficient intensity to produce runoff. However, these infrequent precipitation events can occur with great intensity, and can produce extensive sheet flow and flooding, which would lead to substantial erosion of unmanaged disturbed and/or stockpiled soil.

Central Region

The potential for localized, short-term degradation of surface water quality through accelerated erosion and sedimentation would be moderate within the Central Region. This Region, which includes the ANF, is characterized by steep slopes and greater precipitation than either the Northern or Southern Regions. Although soils in the Central Region generally have a high capacity for absorption, the Central Region is subject to intense storm events that generate precipitation that exceeds the soil's capacity to absorb moisture. Under these conditions, substantial runoff is probable. Without the proper implementation of soil management practices, disturbed and/or stockpiled soil, especially disturbances associated with road construction and/or improvement, would have a moderate potential for erosion during these storm events. In many cases, such as along Monte Cristo Creek, access road construction and/or improvement would occur directly adjacent to a stream channel, which, without the proper implementation of soil management practices, would have a moderate potential to temporarily accelerate sedimentation of the nearby stream should a large storm event occur. Implementation of best management practices would substantially reduce the potential for water quality degradation through accelerated erosion and sedimentation.

For the Central Region, the predicted annual average increase in erosion and sedimentation resulting from construction activities under the proposed Project and alternatives have been analyzed using GIS-based erosion and sedimentation modeling techniques. As discussed in the *GIS-Based Soil Erosion and Sedimentation Analysis Report*, which is presented as Appendix A of this Specialist Report, the GIS-based model focused on Project-related erosion and sedimentation that would occur in the Central Region due to several primary factors, including the following: soil-disturbing activities on the ANF would introduce the potential for erosion and sedimentation to result in degradation of important aquatic habitat, which would be intensified in the Forest due to steep topography, the occurrence of intense rainfall events, and the presence of extensive habitat for sensitive aquatic species. The modeling results are presented and discussed in Appendix A of this Specialist Report.

Southern Region

The potential for localized, short-term degradation of surface water quality through erosion and sedimentation would be low to moderate within the Southern Region. This region is highly urbanized and most of the stream crossings are channelized and lined with concrete. The vast majority of all Project work would occur outside of drainages, with the exception of Project structures that would be placed in detention basins and construction activities that could affect drainages in open areas such as the Puente Hills and Chino Hills. The topography is relatively flat compared to the Central Region. Most runoff quickly enters the municipal storm drain system. Erosion from disturbed and/or stockpiled soil would have a low to moderate potential to enter nearby streams during storm events.

APM HYD-1 (Construction SWPPP) and APM HYD-2 (Environmental Training Program) would reduce the likelihood of construction-related water quality degradation through erosion and sedimentation. APM HYD-1 requires implementation of a Construction SWPPP, which would include several BMPs to reduce

erosion and sedimentation, such as straw wattles, water bars, covered stockpiles, silt fences, silting basins, and mulching or seeding to protect exposed areas as well as monitoring to ensure that the BMPs are implemented. APM HYD-2 requires establishment of an environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, and SWPPP measures, to all field personnel. Although the APM HYD-1 and APM HYD-2 would reduce the potential for soil erosion and deposition of sediment into stream channels, erosion and sediment deposition could still occur. Additionally, site-specific requirements, such as soil management requirements within the ANF, may require BMPs beyond those specified by the RWQCBs in the SWPPP, or may prohibit specific BMPs that would otherwise be allowed by the RWQCBs. Guidance on erosion control practices within the ANF can be found in the *Water Quality Management for Forest System Lands in California, Best Management Practices* handbook (USDA, 2000).

In order to further reduce the potential for localized, short-term degradation of surface water quality through erosion and sedimentation, especially within the ANF, implementation of Mitigation Measures H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) and H-1b (Dry weather construction), in addition to Mitigation Measure B-2 (Implement RCA Treatment Plan) as described in the EIR/EIS (Section 3.4: Biological Resources), would be required. Mitigation Measure H-1a would require that an Erosion Control Plan be submitted to the CPUC and the USDA Forest Service prior to commencement of any soil-disturbing activities. This plan would include a logbook that records major precipitation events and evaluates the effectiveness of existing BMPs. Iterative review of the logbook by the CPUC and the USDA Forest Service will provide the opportunity to employ adaptive management practices through review and modification, if necessary, of existing BMPs and their effectiveness. Evaluation of the effectiveness of the BMPs can be narrative, and need not include water quality testing unless otherwise required by the RWQCBs, CPUC, USDA Forest Service, or any other jurisdictional agency. Within the ANF, the applicant shall follow the Best Management Practice Evaluation Process set forth in the *Water Quality Management for Forest System Lands in California, Best Management Practices* (USDA, 2000). Examples of typical BMPs can be found in the California Department of Transportation's (Caltrans') *Stormwater Quality Handbooks, Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual* (Caltrans, 2007). Some of the more commonly employed BMPs include: preservation of existing vegetation, mulching, hydroseeding, soil binders, geotextiles, silt fences, sediment/desilting basins, check dams, fiber rolls, straw bale barriers, and stockpile management. Mitigation Measure H-1b would minimize soil-disturbing activities during wet weather in the Angeles National Forest and Chino Hills State Park, and would prohibit soil-disturbing activities on those lands during major storm events, unless otherwise authorized by the Forest Service or State Park. On steeply sloped topography subject to intense precipitation, limiting construction to dry weather substantially lowers the potential to cause erosion and water quality degradation. Mitigation Measure B-2 would require the applicant to receive ANF approval before constructing or modifying any structure, culvert, or bridge or modifying any habitat on NFS lands in Riparian Conservation Areas.

Mitigation Measures for Impact H-1

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits.** SCE shall develop and submit to the CPUC and FS for approval 30 days prior to construction an Erosion Control Plan, and implement Best Management Practices (BMPs), as described below. (Note: The Erosion Control Plan may be part of the same document as the Stormwater Pollution Prevention Plan.) Within the Erosion Control Plan, the applicant shall identify the location of all soil-disturbing activities, including but not limited to new and/or

improved access and spur roads, the location of all streams and drainage structures that would be directly affected by soil-disturbing activities (such as stream crossings by access roads), and the location and type of all BMPs that would be installed to protect aquatic resources. The Erosion Control Plan shall include a proposed schedule for the implementation and maintenance of erosion control measures and a description of the erosion control practices, including appropriate design details. As part of the Erosion Control Plan, SCE shall maintain a logbook of all precipitation events within the Project area that produce more than one inch of precipitation within a 24-hour period. The logbook shall contain the date of the precipitation event, the approximate duration of the event, and the amount of precipitation (measured as the largest amount recorded by a rain gage or weather station within one mile of the Project). Additionally, the logbook shall include a narrative evaluation (and/or a numerical evaluation, if required by the FS or other jurisdictional agency) of the erosion-prevention effectiveness of the existing BMPs, as well as a description of any post-storm modifications to those BMPs. The logbook shall be submitted to the CPUC and FS for review within 30 days following the first storm event (after construction has begun) that produces greater than one inch of precipitation within a 24-hour period. SCE shall re-submit the logbook annually after the first storm of the rainy season that produces more than one inch of precipitation within a 24-hour period. The logbook shall be retired 5 years after completion of construction.

In addition to the Erosion Control Plan, the applicant shall submit to the CPUC and the FS evidence of possession of all required permits before engaging in soil-disturbing construction/ demolition activities, before entering flowing or ponded water, or before constructing a crossing at flowing or ponded water. Such permits may include, but are not limited to, a Streambed Alteration Agreement from the California Department of Fish and Game, a Clean Water Act (CWA) Section 404 permit from the USACE, a CWA Section 402 NPDES General Permit for Storm Water Discharges Associated with Construction Activities (General Permit) from the applicable Regional Water Quality Control Board(s) (RWQCBs), and/or a CWA Section 401 certification from the applicable RWQCBs. In addition, if construction-related excavation activities on National Forest System (NFS) lands encounter perched groundwater, triggering the need for dewatering activities to occur in compliance with Applicant-Proposed Measure HYD-6 (Drilling and Construction Site Dewatering Management), SCE shall notify the Forest Service at the onset of dewatering and, upon the completion of dewatering activities at the affected site(s), SCE shall submit to the Forest Service written description of all executed dewatering activities, including steps taken to return encountered groundwater to the subsurface.

H-1b **Dry weather construction.** Any construction activities within the ANF and/or Chino Hills State Park (CHSP) [CHSP is only included as part of this measure for Alternative 4 (Routes A through D)] shall be scheduled to avoid anticipated precipitation events that are predicted to produce more than one inch of precipitation over a 24-hour period, unless expressly authorized by the FS and/or California Department of Parks and Recreation (State Parks). If an unexpected precipitation event occurs while construction activities are already underway, SCE shall contact the FS and/or State Parks for guidance. The FS and/or State Parks may require cessation of construction activities within their jurisdiction during any precipitation event in order to prevent excessive erosion and to protect aquatic resources. On NFS lands, SCE shall also observe any criteria promulgated by the FS regarding construction during precipitation events. SCE shall provide documentation to the CPUC monitor of all wet-weather coordination with the FS and/or State Parks.

CEQA Significance Conclusion

Implementation of Mitigation Measures H-1a, H-1b, and B-2 would substantially reduce the potential for erosion and sedimentation by ensuring that construction activities employ the most effective erosion control practices, avoid periods of heavy precipitation, and minimize disturbance to Riparian Conservation Areas. These measures would minimize the potential for disturbed or stockpiled soil to be carried into nearby streams. Therefore, Impact H-1 would be reduced to a less-than-significant level (Class II).

Impact H-2: Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials.

Surface water and groundwater quality could be degraded through the accidental release of hazardous materials into a dry or flowing stream channel during Project-related construction activities. Such materials include: lead-based paint flakes, diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, lubricant grease, cement slurry, and other fluids required for the operation of construction vehicles and equipment. The transportation of concrete and the use of motorized equipment are examples of construction activities that would involve the use of potentially harmful materials. Motorized equipment could leak hazardous materials such as motor oil, transmission fluid, or antifreeze due to inadequate or improper maintenance, unnoticed or unrepaired damage, improper refueling, or operator error. The release of one or more hazardous materials into a stream channel could occur at any stream crossing within the Project area, or at any of the Project staging areas, such as marshalling yards and helicopter staging areas, that are crossed by or directly adjacent to a stream channel.

Surface water could be contaminated through either direct or indirect contact with potentially harmful or hazardous materials. Direct contact with these materials would result from a spill or leak that occurs directly above or within the bed and banks of a flowing stream or waterbody. An accidental release of a potentially harmful or hazardous material into a dry stream bed or wash would not directly impact water quality. Similarly, an accidental spill or release of hazardous materials outside of a stream channel would not directly impact water quality. However, accidental spills or releases of hazardous materials into a dry stream bed or wash, or outside of a stream channel, could indirectly impact water quality through runoff during a subsequent storm event, when the spilled material could come in contact with or be washed into a flowing stream or waterbody. Please refer to the EIR/EIS, Section 3.6 (Environmental Contamination and Hazards), for further analysis on the impact of an accidental release of hazardous materials outside the bed and bank of a stream channel.

Groundwater could be contaminated through indirect contact with potentially harmful or hazardous materials. Because depth to groundwater throughout the Project Regions is approximately 75 feet or more bgs, and the maximum construction-related excavation depth is approximately 40 feet bgs, no direct contact with groundwater would occur during construction of the proposed Project. However, accidental spills or releases of hazardous materials into a dry or flowing stream channel could indirectly impact groundwater through leaching. Stream channels often facilitate infiltration into the underlying groundwater and therefore an accidental release of hazardous materials within a stream channel would have a greater potential to indirectly impact groundwater resources than would an accidental release of hazardous materials outside the bed and banks of a stream channel. Hazardous material spills that are left on the ground surface within a dry stream channel and are followed quickly by a storm event could leach through the soil and into the groundwater, thereby resulting in the degradation of groundwater quality.

Northern Region

The potential for degradation of water quality through the accidental release of harmful or hazardous materials during Project construction would be relatively low within the Northern Region. Because almost all streams crossed by the proposed Project within the Northern Region are dry for most of the year, direct contamination of a waterbody by accidental spill or release of a hazardous material is unlikely.

Central Region

The potential for degradation of water quality through accidental release of potentially harmful or hazardous materials would be moderate within the Central Region. Several of the streams in the Central Region have a year-round base flow. In addition, topography in the Central Region is generally steep and characterized by relatively narrow canyons. An accidental release of hazardous materials during Project construction could result in direct contamination of a surface waterbody in the Central Region.

Southern Region

The potential for degradation of water quality through accidental release of potentially harmful or hazardous materials would be relatively low within the Southern Region. Most streams are channelized and lined with concrete, and most construction activities would occur outside of these concrete stream channels. Accidental release of hazardous materials could enter a surface waterbody through the storm drain system; however, except during rare periods of heavy precipitation, any accidental release of hazardous materials could be contained before entering the storm drain system.

The following APMs, which are considered to be part of the Project description, would reduce the likelihood that an accidental spill or release of hazardous materials would directly or indirectly impact water quality: HYD-1 (Construction SWPPP), HYD-2 (Environmental Training Program), HYD-3 (Accidental Spill Control), HYD-4 (Non-storm Water and Waste Management Pollution Controls), and HAZ-2 (Hazardous Materials and Waste Handling Management). APM HYD-1 requires implementation of a Construction SWPPP, which would define the following: where hazardous materials would be stored; where trash would be placed; where motorized equipment would be parked, fueled, and serviced; and where construction materials would be stored. APM HYD-2 requires establishment of an environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, and SWPPP measures, to all field personnel. APM HYD-3 requires that the Construction SWPPP include an emergency response program to ensure quick and safe cleanup of accidental spills. APM HYD-4 requires that excess concrete and concrete slurry that is produced during tower and substation construction would be retained on-site within a bermed area and then transported to an approved landfill for disposal. APM HAZ-2 requires development of a Project-specific hazardous materials management and hazardous waste management program, which would outline proper hazardous materials use, storage and disposal requirements as well as hazardous waste management procedures. All Project personnel would be provided with Project-specific training.

Although the APMs APM HYD-1 through APM HYD-4 and APM HAZ-2 would reduce the potential for water quality degradation through the accidental release of potentially harmful or hazardous materials, these adverse effects could still occur. In order to further reduce the potential for degradation of water quality through accidental release of potentially harmful or hazardous materials, implementation of Mitigation Measure H-1b, described under the discussion for Impact H-1, would be required.

CEQA Significance Conclusion

Implementation of Mitigation Measure H-1b would substantially reduce the potential for water quality degradation through accidental release of potentially harmful or hazardous materials by minimizing the potential for such materials to directly contact surface water or leach into the groundwater, and would therefore reduce Impact H-2 to a less-than-significant level **(**Class II**)**.

Impact H-3: Operation and maintenance activities would degrade water quality through the accidental release of potentially harmful or hazardous materials.

Surface water quality could be directly impacted through the accidental release of harmful or hazardous materials within a stream channel during Project operation and maintenance activities at stream crossings along access roads and near tower locations. Due to the use of vehicles and other motorized equipment during operations and maintenance, some of the potentially hazardous substances that could be released include: diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, and lubricant grease. These materials could contaminate surface water directly through contact with a flowing stream. Groundwater resources could be indirectly affected if the hazardous materials were left on the ground surface and allowed to leach into the groundwater. There are multiple federal, State, and local agencies and bodies of law with authority over the mitigation of hazardous materials spills. The specific authority over a spill depends on multiple factors such as the location and nature of the spill.

In contrast with construction activities, which would include more intensive use of heavy equipment for longer periods of time, 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 via helicopter and light truck, with maintenance performed on an as-needed basis.

Northern Region

The potential for degradation of water quality through the accidental release of potentially harmful or hazardous materials during operation and maintenance activities would be low within the Northern Region. Because almost all streams crossed by the proposed Project within the Northern Region are dry for most of the year, direct contamination of a waterbody by accidental spill or release of a hazardous material is unlikely.

Central Region

The potential for degradation of water quality through accidental release of potentially harmful or hazardous materials during operation and maintenance activities would be low to moderate within the Central Region. Several of the streams in the Central Region have a year-round base flow. The topography is steep and characterized by relatively narrow canyons. An accidental release of hazardous materials could potentially come in direct contact with a surface waterbody, though this potential is reduced due to the low number of truck trips that would occur during operation and maintenance activities.

Southern Region

The potential for degradation of water quality through accidental release of potentially harmful or hazardous materials during operation and maintenance activities in the Southern Region would be low. Most streams are channelized and lined with concrete, and most operation and maintenance activities would occur outside of these concrete stream channels. Accidental releases of hazardous materials could enter a surface waterbody through the storm drain system. However, except during rare periods of heavy

precipitation, any accidental release of hazardous materials could be contained before entering the storm drain system.

The following APMs, which are considered to be part of the Project description, would reduce the likelihood that an accidental spill or release of hazardous materials during operation and maintenance activities would directly or indirectly impact water quality: HYD-2 (Environmental Training Program) and HYD-3 (Accidental Spill Control). APM HYD-2 requires that all field personnel are trained on environmental concerns and appropriate work practices, including spill prevention and response measures. APM HYD-3 requires that the Construction SWPPP include an emergency response program to ensure quick and safe cleanup of accidental spills.

CEQA Significance Conclusion

Implementation of APMs HYD-2 and HYD-3 would substantially reduce the potential for water quality degradation through accidental release of potentially harmful or hazardous materials by ensuring that inspection and maintenance personnel have the knowledge and means to quickly and effectively address accidental releases of hazardous materials. Because these APMs would minimize the potential for accidental spills of potentially harmful or hazardous materials to directly contact or be carried into nearby waterways, or leach into the groundwater, Impact H-3 would be less than significant (Class III).

Depletion of Groundwater Supplies or Interference with Groundwater Recharge (Criterion HYD2)

Should groundwater be encountered during construction-related excavation, dewatering of the construction site would be required. Depth to groundwater throughout the Project area is approximately 75 feet or more below ground surface (bgs), while the maximum construction-related excavation depth is approximately 40 feet bgs. Therefore, Project construction activities would not result in direct contact with a main groundwater table. However, it is possible that construction-related excavation could encounter areas of perched groundwater, especially when drilling or construction during the wet season. Perched groundwater is a zone of saturation that is separated from the main groundwater table by a typically impermeable divide. Perched groundwater may be ephemeral in nature (occurring in direct response to precipitation events), or it may be recharged by percolation from surface water and/or nearby saturated zones. As mentioned above, dewatering of the construction area would be required if groundwater (including perched groundwater) is encountered during excavation activities. In accordance with APM HYD-6 (Drilling and Construction Site Dewatering Management), dewatering operations would include, as applicable, the use of sediment traps and sediment basins per BMP NS-2 (Dewatering Operations) from the California Stormwater Quality Association's (CASQA) California Stormwater BMP Handbook – Construction (CASQA, 2003). Any groundwater encountered during construction would be returned to the subsurface as a part of the dewatering process. Although construction-related excavation activities may encounter perched groundwater, thus requiring dewatering activities in accordance with APM HYD-6, such activities would not contribute to the depletion of groundwater supplies or the interference with groundwater recharge.

Creation of new impervious surfaces through construction of the proposed Project could interfere with groundwater recharge by reducing the amount of surface area through which precipitation and surface water percolates to underground aquifers. Impervious surfaces that would result from construction of the proposed Project include concrete tower footings, concrete pads beneath various substation elements, such as transformer banks, and paved or sealed access roads. The concrete tower footings and concrete pads

beneath various substation elements would cover very small areas and would be distributed over a large geographic region, and therefore would not substantially interfere with groundwater recharge.

Operation of the proposed Project would consist of transmission of electric current though the transmission line as well as periodic maintenance which would consist of driving construction vehicles along or within the transmission ROW and would have no effect on groundwater recharge. Therefore, no depletion of groundwater supplies or substantial interference with groundwater recharge would result from operation and maintenance of the proposed Project.

Northern Region

The creation of new paved or sealed access roads would result in an incremental increase in the amount of impervious surface area within the Northern Region. However, the vast majority of these roads would be unpaved and would not interfere with groundwater recharge. No impact would occur.

Central Region

New access roads within the Central Region would be subject to requirements of the USDA Forest Service road Maintenance Level standards for the ANF and therefore would not substantially increase the amount of impervious surface area in the Central Region. Implementation of the proposed Project would not interfere with groundwater recharge in the Central Region. No impact would occur.

Southern Region

The vast majority of the Southern Region is already covered by impervious surface and groundwater recharge is accomplished through managed groundwater injection. Creation of new or improved access roads would not substantially alter the amount of impervious surface area within the Southern Region. No impact would occur.

Mitigation Measure for Significance Criterion HYD-1

As described above, the proposed Project would not cause or contribute to the depletion of groundwater supplies or interference with groundwater recharge in the Project area, and would therefore result in No Impact under Significance Criterion HYD-1. However, at the request of the Forest Service, Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) has been expanded to include language that requires SCE to notify the Forest Service when dewatering activities associated with perched groundwater are required in accordance with APM HYD-6 (Drilling and Construction Site Dewatering Management). This modification of existing mitigation does not alter the impact analysis presented above for Significance Criterion HYD-1; rather, it reinforces previously introduced mitigation (MM H-1a) and requires notification of procedures developed by the Applicant for inclusion as part of the Project (APM HYD-6).

Siltation, Erosion, or Other Flood-related Damage from Impeding or Redirecting Flood Flows through Placement of a Structure in a Stream or Flood Hazard Area (Criterion HYD3)

Impact H-4: Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows.

Encroachment of a Project structure into a stream channel or floodplain could result in flooding of or erosion damage to the encroaching structure, diversion of flows and increased flood risk for adjacent

property, or increased erosion on adjacent property. As shown in Figures 2-2, 2-4, and 2-5, the proposed Project would traverse several individual FEMA-designated Flood Hazard Areas.

Northern Region

In the Northern Region, the proposed Project would cross through Flood Hazard Areas associated with the following canyons or waterways: Oak Creek, the Los Angeles Aqueduct, Broad Canyon, Myrick Canyon, California Aqueduct, Amargosa Creek, Anaverde Creek, and Soledad Canyon.

Central Region

In the Central Region, the proposed Project would cross one Flood Hazard Area associated with Kentucky Springs Canyon. Additional flood hazards may be associated with streams within the ANF, but FEMA does not map Flood Hazard Areas within the Forest.

Southern Region

In the Southern Region, the proposed Project would cross several Flood Hazard Areas, including those associated with the following waterways: Whittier Narrows Flood Control Basin (which includes the San Gabriel River and the Rio Hondo), Santa Fe Flood Control Basin, Little Chino Creek, Carbon Canyon, Chino Creek, Cypress Channel and Cucamonga Creek (SCE, 2007).

According to FEMA, development is permitted in Flood Hazard Areas provided that the development complies with local floodplain management ordinances (FEMA, 2005). All applicable floodplain management ordinances would be fully complied with in accordance with FEMA's regulations on development in Flood Hazard Areas. In addition to the design standards specified by FEMA's floodplain management ordinances, APM HYD-7 (Flood and Erosion Structure Damage Protection), which is part of the proposed Project design, would require that aboveground Project features such as transmission line towers and substation facilities be designed and engineered to withstand potential flooding and erosion hazards. Measures would include specially designed footings to withstand flooding due either to a 100-year flood event or failure of a nearby upstream dam or reservoir. Impact H-4 is most likely to occur where transmission towers or other permanent Project features are constructed in or closely adjacent to a watercourse. None of the infrastructure associated with the proposed Project would be situated within a watercourse (SCE 2007). However, some towers would be placed in areas subject to periodic overland flow and flooding, such as the Santa Fe Flood Control Basin, the Whittier Narrows Flood Control Basin, and some broad, ephemeral washes in the Northern Region.

Although APM HYD-7 would reduce the potential for flooding of or erosion damage to the encroaching structure, it would not address the potential for that structure to divert flood flows, increase the flood risk for adjacent property, or increase the erosion on adjacent property. In order to reduce the potential for the encroaching structure to result in these adverse effects, implementation of Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) would be required. This mitigation measure would ensure that appropriate BMPs are employed to reduce the potential for erosion during construction activities. It would also require demonstrated compliance with all required water quality permits, including compliance with any applicable floodplain management ordinances, as required by FEMA.

CEQA Significance Conclusion

Implementation of Mitigation Measure H-1a would substantially reduce the potential for damage due to flooding or erosion of the encroaching structure, diversion of flood flows and increased flood risk for adjacent property, or increased erosion on adjacent property through implementation of an erosion control plan and demonstrated compliance with applicable permits, such as local floodplain management ordinances. Because this measure would minimize the potential for damage due to flooding or erosion of either the encroaching structure or adjacent property, Impact H-4 would be reduced to a less-than-significant level **(**Class II**)**.

Flooding from Increased Rate or Amount of Surface Runoff (Criterion HYD4)

The rate and amount of surface runoff is determined by multiple factors, including the following: amount and intensity of precipitation; amount of other imported water that enters a watershed; and amount of precipitation and imported water that infiltrates to the groundwater. Infiltration is determined by several factors, including soil type, antecedent soil moisture, rainfall intensity, the amount of impervious surfaces within a watershed, and topography. The rate of surface runoff is largely determined by topography and the storm hydrograph (the intensity of rainfall over a given period of time).

The proposed Project would not alter any precipitation amounts or intensities, nor would it require any additional water to be imported into the proposed Project area. Although grading would occur at tower locations, new and/or expanded substations, crane pads, pulling and splicing stations, and access roads, this ground disturbance would be spread over a large geographic area and would not alter the overall topography of the proposed Project area. Impervious surfaces that would result from construction of the proposed Project include concrete tower footings, concrete pads beneath various substation elements such as transformer banks and paved or sealed access roads. Concrete tower footings and concrete pads beneath various substation elements would cover very small areas and would be distributed over a large geographic region, and therefore would not substantially interfere with groundwater infiltration. The proposed Project would not alter precipitation amounts or intensities, or the amount of precipitation or imported water that infiltrates into the groundwater. Therefore, the rate or amount of surface runoff resulting from the proposed Project would not change relative to existing conditions.

Northern Region

The creation of new paved or sealed access roads would increase the amount of impervious surface area within the Northern Region; however, the vast majority of these roads would be unpaved and would not substantially interfere with groundwater infiltration. No impact would occur.

Central Region

New access roads within the Central Region would be subject to regulations of the USDA Forest Service for the ANF and would comply with all road Maintenance Level requirements. Therefore, new or improved access roads within the Central Region would not increase the amount of impervious surface area and would not interfere with infiltration. No impact would occur.

Southern Region

The vast majority of the Southern Region is already covered by impervious surface, and surface runoff is managed through a system of municipal storm drains. Groundwater infiltration is accomplished either through injection wells, infiltration and retention basins, or open spaces such as the Chino and Puente Hills. Creation of new or improved access roads would not substantially alter the amount of impervious

surface area within the Southern Region and, therefore, would not interfere with groundwater infiltration or the conveyance of surface runoff to drainage channels through the storm drains. No impact would occur.

Damage from Inundation by Mudflow (Criterion HYD5)

Impact H-5: Project structures would be inundated by mudflow.

Mudflows are a type of mass wasting or landslide, where earth and surface materials are rapidly transported downhill under the force of gravity. Mudflow events are caused by a combination of factors, including soil type, precipitation, and slope. Mudflow may be triggered by heavy rainfall that the soil is not able to sufficiently drain or absorb. As a result of this super-saturation, soil and rock materials become unstable and eventually slide away from their existing location.

Northern Region

The Northern Region is characterized by generally flat terrain that would not be conducive to a mudflow event.

Central Region

Although the Central Region receives heavy seasonal precipitation and contains areas of steep slopes that would increase the probability of mudflow events, the soils within the region are not prone to mudslides.

Southern Region

The majority of the Southern Region is characterized by generally flat terrain that would not be conducive to a mudflow event. However, the steeper portions of the Puente and Chino Hills do contain soils that could form a mudflow under heavy precipitation.

The potential for inundation of Project structures by mudflow is reduced by the implementation of APM HYD-1 (Construction SWPPP) and APM HYD-7 (Flood and Erosion Structure Damage Protection), which are included under the Project description. APM HYD-1 requires implementation of a Construction SWPPP, which would include several BMPs to reduce erosion and soil movement, such as straw wattles, water bars, covered stockpiles, silt fences, silting basins, and mulching or seeding to protect exposed areas as well as monitoring to ensure that the BMPs are implemented. APM HYD-7 would require that aboveground Project features such as transmission line towers and substation facilities be designed and engineered to withstand potential flooding and erosion hazards. Measures would include specially designed footings to withstand flooding due either to a 100-year flood event or failure of a nearby upstream dam or reservoir. These design features would also help proposed Project structures withstand inundation by mudflow.

Although APM HYD-1 and APM HYD-7 would reduce the potential for damage of Project structures due to inundation by mudflow, this adverse effect could still occur, especially in the Puente and Chino Hills. In order to further reduce the potential for inundation by mudflow, implementation of Mitigation Measure G-3 (Conduct geological surveys for landslides and protect against slope instability), as described in the EIR/EIS, Section 3.7 (Geology, Soils, and Paleontology), would be required.

CEQA Significance Conclusion

Implementation of Mitigation Measure G-3 would substantially reduce the potential for inundation by mudflow during the construction phase of the proposed Project. By avoiding areas prone to landslide, and by installing appropriate protection where those areas cannot be avoided, Project structures will not be placed in locations that are prone to landslide and/or mudslide without proper protection. Because this measure would minimize the potential for damage due to inundation by mudflow, Impact H-5 would be reduced to a less-than-significant level **(**Class II**)**.

6.2 Cumulative Effects Analysis

A cumulative impact is one that results from the incremental impact of the proposed Project when combined with other past, present, and reasonably foreseeable future actions that occur within the geographic extent of the cumulative effects analysis.

6.2.1 Geographic Extent

The geographic extent of this cumulative effects analysis is the same as the extent of the regional setting, as described in Section 2 (Affected Environment). As such, this cumulative effects analysis is organized into the following three geographic regions: Northern Region, Central Region, and Southern Region. The Northern Region includes all Project components located between the Windhub Substation in southern Kern County to Vincent Substation located in unincorporated Los Angeles County. The Central Region includes all portions of the TRTP extending from Vincent Substation to the southern boundary of the ANF. The Southern Region includes all Project components located south of the ANF within Los Angeles, Orange, and San Bernardino Counties.

The proposed Project would cross the South Lahontan and South Coast HRs. These Hydrologic Regions are too large to use as geographic boundaries for consideration of cumulative effects. Because Hydrology and Water Quality impacts are typically contained within watersheds associated with major drainages (Hydrologic Units), and because water quality regulations such as TMDLs are generally implemented at the Hydrologic Unit level, the geographic extent of this cumulative effects analysis will be limited to the Hydrologic Units crossed by the proposed Project. Additional significance will be given to projects that lie within the specific Hydrologic Areas and Hydrologic Sub-Areas crossed by the proposed Project and alternatives. Within the South Lahontan and South Coast HRs, the proposed Project would cross the following Hydrologic Units: the Antelope HU, the Los Angeles River HU, the San Gabriel River HU, the Santa Ana River HU, and the Santa Clara-Calleguas HU.

6.2.2 Existing Cumulative Conditions

This section discusses the past projects that have occurred in the cumulative analysis area described above, in addition to ongoing projects in the area. A wide variety of past and present development projects contribute to the cumulative conditions for Hydrology and Water Quality in the Project area. A discussion of cumulative projects in the Project area is provided in the EIR/EIS, Section 2.9 (Cumulative Projects). Consideration of the projects identified in that section was used to develop this analysis of cumulative effects on Hydrology and Water Quality.

Several types of development projects could contribute to the cumulative impact of the proposed Project, including housing development projects, commercial and industrial development, water infrastructure projects, and water quality improvement projects. These types of past and existing projects could combine with several proposed Project impacts to affect hydrology and water quality. Some of these possible

impacts include: alteration of the landscape, degradation of water quality through encroachment on stream channels, discharge of treated wastewater, and introduction of potentially hazardous substances to stormwater runoff.

A list of existing projects within the cumulative analysis area is found in the EIR/EIS, Section 2.9 (Cumulative Projects). This Cumulative Impact Scenario indicates that the vast majority of ongoing projects are residential developments. Furthermore, the population growth estimates portrayed in this scenario indicate that rapid population growth has not only occurred in the past, but it is ongoing and expected to continue into the future. Therefore, it is reasonably assumed that ongoing projects within the cumulative analysis area are characterized primarily by residential developments. A few major examples of these developments include the Ritter Ranch development, the Anaverde Ranch development, and the Agua Dulce Residential Project. Hundreds of smaller residential projects are either currently being developed or have been developed in the recent past.

In addition to residential development, two important water-conveyance features exist within the Project area: the SWP's California Aqueduct and LADWP's Los Angeles Aqueduct. In the Project area and vicinity, the former is contained within concrete channels and pipes and the latter is in pipes. The California Aqueduct is 444 miles long and transports water south for both the SWP and the federal Central Valley Project. The Los Angeles Aqueduct is 223 miles long and transports water to the southern California market from the Owens Valley, to the north. The proposed Project would cross both the California Aqueduct and the Los Angeles Aqueduct, as described in Section 2.2 (Regional Setting) and Section 2.3 (Alternative 2). In addition to the California Aqueduct and the Los Angeles Aqueduct, other major water development projects in the Project area include Lake Palmdale, Littlerock Reservoir, Santa Fe Flood Control Basin, Whittier Narrows Flood Control Basin, and a variety of other dams, reservoirs, and diversion projects throughout the five Hydrologic Units listed above.

6.2.3 Reasonably Foreseeable Future Projects and Changes

As discussed above, ongoing development throughout the cumulative effects area for Hydrology and Water Quality is dominated by residential developments, clustered in and around established community areas. This trend in residential development is also representative of reasonably foreseeable future projects in the cumulative effects area, as supported by the aggressive population growth forecast in the Cumulative Impact Scenario. Two examples of major foreseeable residential development include the Aera Master Planned Community near the City of Diamond Bar and the New Model Colony near the City of Ontario. Numerous other residential developments throughout the cumulative effects area are in various stages of planning.

In addition to the reasonably foreseeable residential developments, a major water infrastructure project called the Antelope Valley Water Bank Project is being planned in the Northern Region. This project proposes to develop facilities to store and recharge imported surface water and associated delivery and distribution pipelines. The 13,440-acre facility area would be bounded by the Kern/Los Angeles County border line (also known as Avenue A) to the south and Rosamond Blvd to the north, and between 170th Street West and 100th Street West in unincorporated Kern County. Segment 4 of the proposed Project would traverse the Water Bank Facility at approximately 160th Street West and Avenue A.

6.2.4 Cumulative Impact Analysis

Impacts of the proposed Project would be cumulatively considerable if they would have the potential to combine with impacts of other past, present, or reasonably foreseeable projects. The potential for Hydrology and Water Quality impacts of the proposed Project to combine with the effects of other projects within the geographic scope of the cumulative analysis is described below.

- **Construction activities would degrade surface water quality through erosion and accelerated sedimentation (Impact H-1).** Construction of the overhead transmission line towers and substations would require several types of soil disturbance. Excavation and/or grading would be required at all tower sites where new pads or footings would be required and at all new and/or expanded substations. Additional clearing of vegetation and/or grading would be required for crane pads, pulling/stringing stations, staging areas, marshalling yards, concrete batch plants, helicopter staging areas, tower wreck-out staging areas, and access and spur roads. Without implementation of proper soil management practices, disturbance of soil during construction could result in soil erosion and short-term impacts to water quality through increased turbidity and sediment deposition into local streams. If construction activities for other projects in the area also result in erosion and sedimentation of nearby surface waters, and such impacts occur at the same time as they would for the proposed Project's construction activities, the resulting impacts would be cumulatively considerable to Hydrology and Water Quality in the Project area. Although mitigation measures that would be implemented for the proposed Project would reduce this impact to a less-than-significant level for the proposed Project itself, several residential development projects with construction activities substantial enough to contribute to erosion and sedimentation within the cumulative effects area, such as the Aera Master Planned Community near the City of Diamond Bar and the New Model Colony near the City of Ontario, are currently scheduled to occur at the same time and in the same vicinity as the proposed Project. These residential projects would likely implement best management practices that would reduce erosion and sedimentation impacts to less-than-significant levels. However, the effectiveness of best management practice implementation for these residential projects is unknown. Therefore, it is possible that this impact of the proposed Project could combine with similar impacts of other projects to result in a cumulatively significant and unavoidable impact **(**Class I**)**.
- **Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials (Impact H-2).** Surface water and groundwater quality could be degraded through the accidental release of hazardous materials during Project-related construction activities. Such materials include: lead-based paint flakes, diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, lubricant grease, cement slurry, and other fluids. The release of one or more hazardous materials could occur at tower installation locations, tower wreck-out staging areas, substation construction locations, staging areas, pulling/stringing stations, refueling stations, helicopter staging areas, concrete batch plants, stream crossings, and other locations where construction activities would occur. If construction activities for other projects in the area also result in the accidental release of potentially harmful or hazardous materials, and such impacts occur at the same time as they would for the proposed Project's construction activities, the resulting impacts would be cumulatively considerable to Hydrology and Water Quality in the Project area. Although mitigation measures that would be implemented for the proposed Project would reduce this impact to a less-than-significant level for the proposed Project itself, several large residential development projects, such as the Aera Master Planned Community near the City of Diamond Bar and the New Model Colony near the City of Ontario, would occur at the same time and in the same vicinity as the proposed Project. It is not possible to predict the accidental release of a hazardous material during construction of these residential development projects, nor is it possible to ensure proper implementation of best management practices for these projects. Therefore, this impact of the proposed Project could combine with similar impacts of other projects to result in a cumulatively significant and unavoidable impact **(**Class I**)**.
- **Operation and maintenance activities would degrade water quality through the accidental release of potentially harmful or hazardous materials (Impact H-3).** Surface and groundwater quality could be degraded through the accidental release of potentially harmful or hazardous materials during Project operation and maintenance activities. Potentially harmful materials could be accidentally released during operational and maintenance activities at or near tower locations 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. Although unlikely due to the few number of vehicle trips required for operation and maintenance, these materials could contaminate surface water through direct contact with water in a stream channel or through runoff to local streams. Within the cumulative analysis area, several large residential development projects are already approved, and several more large residential development projects are planned, such as the Aera Master Planned Community near the City of Diamond Bar and the New Model Colony near the City of Ontario. Operational activities for a residential development would include occupancy of the development, use of the residential facilities, including use of water resources and discharge of wastewater, and vehicle trips by residents and visitors to and from the residential development. These residential development operation activities could lead to an accidental release of potentially harmful or hazardous materials. These potential impacts would affect many of the same streams that would be crossed by the proposed Project. However, existing water quality regulations would greatly reduce the potential for an accidental release of hazardous materials. Therefore, it is unlikely that this impact of the proposed Project would combine with similar impacts of other projects. This impact would be less than significant (Class III).

- **Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows (Impact H-4).** Encroachment of a Project structure into a stream channel or floodplain could result in flooding of or erosion damage to the encroaching structure, diversion of flows and increased flood risk for adjacent property, or increased erosion on adjacent property. Impact H-4 is most likely to occur where transmission towers or other permanent Project features are constructed in or closely adjacent to a watercourse. None of the infrastructure associated with the proposed Project would be situated within a watercourse (SCE 2007). However, some towers would be placed in areas subject to periodic overland flow and flooding, such as the Santa Fe Flood Control Basin, the Whittier Narrows Flood Control Basin, and some broad, ephemeral washes in the Northern Region. Numerous present and foreseeable residential development projects, such as the Aera Master Planned Community near the City of Diamond Bar and the New Model Colony near the City of Ontario, could impede flood flows if proper design features were not implemented. However, because the proposed Project would create no impact, it would not combine with any potential impact from present and foreseeable residential development projects. Therefore, no cumulative impact would occur.
- **Project structures would be inundated by mudflow (Impact H-5).** Mudflows are a type of mass wasting or landslide, where earth and surface materials are rapidly transported downhill under the force of gravity. Mudflow events are caused by a combination of factors, including soil type, precipitation, and slope. Mudflow may be triggered by heavy rainfall that 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. For the proposed Project, the potential for inundation of Project structures by mudflow would be reduced to a less-than-significant level through the implementation of Mitigation Measure G-3, described under the discussion for Impact H-5. While the present and reasonably foreseeable residential development projects in the cumulative effects area could potentially increase the probability that Project structures would be inundated by mudflow, this potential is likely very low because residential development projects tend to decrease the overall slope in an area through grading and earth movement. An overall decrease in slope would lower the probability that Project structures would be inundated by mudflow. Therefore, the cumulative impact of inundation of Project structures by mudflow is considered less than significant (Class III).

In summary, the proposed Project would contribute to two Hydrology and Water Quality impacts that would be cumulatively significant and unavoidable (Class I) and two Hydrology and Water Quality impacts that would be considered less than significant (Class III).

6.2.5 Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for the proposed Project in Section 6.1 (Direct and Indirect Effects Analysis) would help to reduce the proposed Project's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level for Hydrology and Water Quality.