D.6 Hydrology and Water Quality

D.6.1 Environmental Setting for the Proposed Project

D.6.1.1 General Setting

The Proposed Project is located in the eastern portions of the Cities of San Diego and Santee, and portions of MCAS Miramar and unincorporated San Diego County. The local climate, as represented by the nearby City of El Cajon, is generally mild with annual temperatures ranging from an average low of 52 degrees to an average high of 78 degrees. Precipitation averages 12 inches per year with 85 percent of all precipitation falling between November and March (Western Regional Climate Center, 2003).

The Proposed Project is located within the jurisdiction of the San Diego Regional Water Quality Control Board (RWQCB), in the San Diego River and Sweetwater Hydrologic Units (watersheds). The San Diego River Hydrologic Unit includes about 440 square miles drained by the San Diego River and includes El Capitan, San Vicente, Cuyamaca, Jennings, and Murray Reservoirs. Much of the impounded water is used to serve a portion of the San Diego metropolitan area and the communities of El Cajon, Santee, Lakeside, Alpine, and Julian. Major tributaries to the San Diego River within the project area include Sycamore Canyon, Wildcat Canyon, Forester Creek, Coches Creek, San Vincente Creek, and Eucalyptus Hills Creek (East and West Branches).

The San Diego River watershed has the highest population of the County's watersheds and contains portions of the Cities of San Diego, El Cajon, La Mesa, Poway, and Santee, along with several unincorporated jurisdictions. Important hydrologic resources in the watershed include the five water storage reservoirs, a large groundwater aquifer, extensive riparian habitat, coastal wetlands, and tidepools. Approximately 58.4 percent of the San Diego River watershed is currently undeveloped, the majority which is in the upper, eastern portion of the watershed. The lower reaches are more highly urbanized, with residential (14.9 percent), freeways and roads (5.5 percent), and commercial/industrial (4.2 percent) being the predominating land uses. The five reservoirs in the San Diego River watershed supply water to as many as 760,000 residents in the region.

The Sweetwater Hydrologic Unit is approximately 230 square miles and is drained by the Sweetwater River. There are two dams on the Sweetwater River, Loveland and Sweetwater Reservoirs. These reservoirs are the primary water supply for the western and central portions of Chula Vista, Bonita, and National City. Steele Canyon Creek is the main tributary to the Sweetwater River within the Proposed Project area.

Over 86 percent of the Sweetwater River watershed is within unincorporated jurisdictions. The dominant land uses in the Sweetwater River watershed are urban (29 percent), open space/agriculture (22 percent), and undeveloped (49 percent). Approximately two-thirds of the land area categorized as urban is composed of residential communities. Approximately 300,000 people currently reside within the Sweetwater River watershed, and this amount is projected to increase to 365,000 by 2015. Because of this increasing development, the protection of municipal water supplies and the protection and restoration of sensitive wetland and wildlife habitats are growing concerns for the maintenance and preservation of the watershed (San Diego Board of Supervisors, 2003).

D.6.1.2 Groundwater

Groundwater in the project area is from two major sources, the Sweetwater Valley Groundwater Basin and the San Diego Groundwater Formation. The San Diego Formation is thought to extend roughly north from the international border with Mexico to the San Diego River and Mission Bay, and west from approximately Interstate 805 (south of Interstate 8) to the San Diego Bay and the Pacific Ocean in the City of San Diego. The San Diego Formation is believed to be at least 1,000 feet thick. Most of this volume, however, cannot be drained without inducing land subsidence and/or eventually causing seawater intrusion (San Diego County Water Authority, 2003).

The Sweetwater Valley Basin's most permeable water-bearing deposit is in Quaternary alluvium, which consists of unconsolidated stream deposits of sandy silt, sand, and cobbles. This unit is the principal source of groundwater in the basin. It has an estimated average thickness of 80 to 100 feet (California Department of Water Resources, 2003). The water from the Sweetwater Valley Basin tends to be brackish, containing high levels of dissolved solids.

D.6.1.3 Water Quality

Within the San Diego River watershed, concerns with water quality can be attributed to increased levels of coliform bacteria, total dissolved solids (TDS), nutrients, petroleum chemicals, toxics, and trash. The source of these contaminants is urban runoff, agricultural runoff, mining operations, sewage spills, and sand and gravel mining. The major water quality constituents of concern for the Sweetwater watershed are coliform bacteria, trace metals and other toxics whose source is predominately from agricultural and urban runoff (San Diego Board of Supervisors, 2003).

D.6.1.4 Floodplains

The Proposed Project has nine crossings of streams that have floodplains delineated by the Federal Emergency Management Agency (FEMA) as Flood Hazard Areas. Figures D.6-1a and D.6-1b show the locations of these floodplains with respect to the Proposed Project. The Proposed Project crosses the following FEMA delineated floodplains starting at a point near Miguel Substation (FEMA, 2003):

- Steele Canyon Creek (FEMA Map FM06073C1931F)
- Sweetwater River (FEMA Maps FM06073C1669F, FM06073C1931F)
- Forester Creek (FEMA Map FM06073C1667F)
- Coches Creek (FEMA Map FM06073C1660F)
- San Diego River (FEMA Map FM06073C1660F)
- San Vicente Creek (FEMA Map FM06073C1393F)
- Eucalyptus Hills Creek East Branch (FEMA Map FM06073C1652F)
- Eucalyptus Hills Creek West Branch (FEMA Map FM06073C1652F).

In addition to the drainage courses mapped by FEMA, the project will cross 16 unmapped drainageways, eight in the Sweetwater watershed and eight in the San Diego River watershed. These include Quail Canyon, Sycamore Canyon and Wildcat Canyon in the San Diego River watershed (see Figures D.6-1a and D.6-1b). In all, the project will cross 25 watercourses, including two crossings of Coches Creek.

Figure D.6-1a. FEMA 100-Year Floodplain and Project Alignment on USGS Topography

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Figure D.6-1b. FEMA 100-Year Floodplain and Project Alignment on USGS Topography

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D.6.2 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 NPDES permit process (CWA Section 402). In California, NPDES permitting authority is delegated to, and administered by, the nine RWQCBs.

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 (USACE) to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. The USACE 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 Water Quality Control Plan for the San Diego Basin (RWQCB, 1994). 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. As with the Streambed Alteration Agreement, the Section 1601 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 San Diego Basin (Basin Plan). The Basin Plan for the San Diego Basin is administered by the State Water Resources Control Board. The Basin Plan is the master policy document that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the San Diego region. The plan describes beneficial uses of water in the San Diego region, water quality objectives, implementation procedures, and water quality plans and policies (RWQCB, 2003).

D.6.3 Environmental Impacts and Mitigation Measures

D.6.3.1 Definition and Use of Significance Criteria

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

- Violates any water quality standards or waste discharge requirements;
- Substantially depletes groundwater supplies or interferes substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted);
- Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river in a manner that would result in substantial erosion of siltation on- or offsite;
- Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increasing the rate or amount of surface runoff in a manner that would result in flooding on- or offsite;
- Creates or contributes runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrades water quality;
- Places within a 100-year flood hazard area structures that would impede or redirect flood flows;
- Exposes people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Results in or is subject to inundation by seiche, tsunami, or mudflow.

D.6.3.2 Project Protocols

Table D.6-1 presents the Project Protocols proposed by the Applicant to reduce impacts to hydrology and water quality.

Table D.6-1. Project Protocols – Hydrology and Water Quality

PP No.	Description
6	Potential hydrologic impacts would be minimized through the use of best management practices (BMPs) such as water bars, silt fences, staked straw bales, and mulching and seeding of all disturbed areas. These measures will be designed to minimize ponding, eliminate flood hazards, and avoid erosion and siltation into any creeks, streams, rivers, or bodies of water.
11	To the extent feasible, access roads would be built at right angles to the streambeds and washes. Where it is not feasible for access roads to cross at right angles, SDG&E would limit roads constructed parallel to streambeds or washes to a maximum length of 500 feet at any one transmission line crossing location. Such parallel roads would be constructed in a manner that minimizes potential adverse impacts on "waters of the U.S." or "waters of the state." Streambed crossings and roads constructed parallel to streambeds would require review and approval of necessary permits from the USACOE, CDFG, and RWQCB. Culverts would be installed where needed for right angle crossings, but rock crossings would be utilized across most right angle drainage crossings. All construction and maintenance activities would be conducted in a manner that would minimize disturbance to vegetation, drainage

Table D.6-1. Project Protocols – Hydrology and Water Quality

PP No.	Description
	channels, and streambanks (e.g., towers would not be located within a stream channel; construction activities would avoid sensitive features). Prior to construction in streambeds and washes, SDG&E would perform three pre-activity surveys to determine the presence or absence of endangered riparian species. Endangered riparian species for which surveys would be performed include the least Bell's vireo, arroyo southwestern toad, and San Diego fairy shrimp. However, these site surveys would not replace the need for SDG&E to perform detailed on-the-ground surveys as required by Protocols 20, 21, 42, 43, and 44. In addition, road construction would include dust-control measures (e.g., watering of construction areas to suppress dust) during construction in sensitive areas, as required. Erosion control during construction in the form of intermittent check dams and culverts should also be considered to prevent alteration to natural drainage patterns and prevent siltation.
16	Hazardous materials would not be disposed of or released onto the ground, the underlying groundwater, or any surface water. Totally enclosed containment would be provided for all trash. All construction waste, including trash and litter, garbage, other solid waste, petroleum products and other potentially hazardous materials, would be removed to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.
35	To minimize ground disturbance impacts to streams in steep canyon areas, access roads in these areas would avoid streambed crossings to the extent feasible. Where it is not feasible for access roads to avoid streambed crossings in steep canyons, such crossings would be built at right angles to the streambeds. Where such crossings cannot be made at right angles, SDG&E would limit roads constructed parallel to streambeds to a maximum length of 500 feet at any one transmission line crossing location. Such parallel roads would be constructed in a manner that minimizes potential adverse impacts on "waters of the U.S." Streambed crossings or roads constructed parallel to streambeds would require review and approval of necessary permits from the ACOE, CDFG, and RWQCB.
38	Secure any required General Permit for Storm Water Discharges Associated With Construction Activity (NPDES permit) authorization from the SWRCB and/or the RWQCB to conduct construction-related activities to build the project and establish and implement a SWPPP erosion control measures during construction to minimize hydrologic impacts in areas sensitive from flooding or siltation into waterbodies.
39	To the extent feasible, where the construction of access roads would disturb sensitive features, the route of the access road would be adjusted to avoid such impacts. Examples of sensitive features include, without limitation, cultural sites, identified habitats of endangered species, and streambeds. As another alternative, construction and maintenance traffic would use existing roads or cross-country access routes (including the right-of-way), which avoid impacts to the sensitive feature. To minimize ground disturbance, construction traffic routes must be clearly marked with temporary markers such as easily visible flagging. Construction routes, or other means of avoidance, must be approved by the authorized officer or landowner before use. When it is not feasible to avoid constructing access roads in sensitive habitats, SDG&E would perform three site pre-activity surveys to determine the presence or absence of endangered or threatened species, or species of special concern, in those sensitive habitats. SDG&E would submit results of those surveys to the USFWS and CDFG in accordance with its NCCP and consult on reasonable and feasible mitigation measures for potential impacts prior to access road construction. However, these pre-activity surveys would not replace the need for SDG&E to perform detailed on-the-ground surveys as required by Protocols 20, 21 42, 43, and 44. Where it is not feasible for access roads to avoid streambed crossings in steep canyons, such crossings would be built at right angles to the streambeds. Where such crossings cannot be made at right angles, SDG&E would limit roads constructed parallel to streambeds, to a maximum length of 500 feet at any one transmission line crossing location. Such parallel roads would be constructed in a manner that minimizes potential adverse impacts on "waters of the U.S." Streambed crossings or roads constructed parallel to streambeds would require review and approval of necessary permits from the USACOE, CDFG, and RWQCB. When it is not feasible to avoid cultural sites, SDG&E would consult with the appropriate federal and State SHPO and local (indigenous Native American tribes) cultural resource agencies and specialists to either develop alternative construction techniques to avoid cultural resources or develop appropriate mitigation measures. Appropriate mitigation measures may include actions such as removal and cataloging and/or removal and relocation.
40	To minimize ground disturbance and/or reduce scarring (visual contrast) of the landscape, the alignment of any new access roads (i.e., bladed road) or cross-country route (i.e., unbladed route) would follow the landform contours in designated areas to the extent feasible, providing that such alignment does not additionally impact sensitive features (e.g., riparian area, habitat of sensitive species, cultural site). To the extent feasible, new access roads would be designed to be placed in previously disturbed areas and areas that require the least amount of grading in sensitive areas. Whenever feasible, in areas where there are existing access roads, preference shall be given to the use of new spur roads rather than linking facilities tangentially with new, continuous roads. Where it is infeasible to locate roads along contours, or in previously disturbed areas, or use spur roads to limit grading, the revegetation/seeding plans for the project would incorporate plant species in areas adjacent to access roads that are capable of screening the visual impacts of the roads.

Table D.6-1. Project Protocols – Hydrology and Water Quality

PP No.	Description
41	In areas designated as sensitive by SDG&E or the resource agencies, to the extent feasible structures and access roads would be designed to avoid sensitive and/or to reduce visual contrast. These areas of sensitive features include but are not limited to high-value wildlife habitats and cultural sites, and/or to allow conductors to clearly span the features, within limits of standard tower or pole design (also see Protocol 52 for avoidance of sensitive water resource features). If the sensitive features cannot be completely avoided, poles and access roads would be placed to minimize the disturbance to the extent feasible. When it is not feasible to avoid constructing poles or access roads in high-value wildlife habitats, SDG&E would perform three site surveys to determine presence or absence of endangered species in those sensitive habitats. SDG&E would submit results of those surveys to the USFWS and CDFG in accordance with its NCCP and consult on mitigation measures for potential impacts, prior to constructing poles or access roads. However, these site surveys would not replace the need for SDG&E to perform detailed on-the-ground surveys as required by Protocols 20, 21 42, 43, and 44. Where it is not feasible for access roads to avoid sensitive water resource features such as streambed crossings, such crossings would be built at right angles to the streambeds. Where such crossings cannot be made at right angles, roads constructed parallel to streambeds would be limited to a maximum length of 500 feet at any, one transmission line crossing location. Such parallel roads would be constructed in a manner that minimizes potential adverse impacts on "waters of the U.S." Streambed crossings or roads constructed parallel to streambeds would require review and approval of necessary permits from the USACOE, CDFG, and RWQCB. When it is not feasible for poles or access roads to avoid cultural sites, SDG&E would consult with the appropriate federal, state SHPO and local (indigenous Native American tribes) cultural resource agencies and specialists to either modify the project or develop alternative construction techniques to avoid cultural resources or develop appropriate mitigation measures. Appropriate mitigation measures may include actions such as data recovery studies, cultural resource removal and cataloging, and/or cultural resource removal and relocation.
52	To the extent feasible, design structure locations to avoid wetlands, streams, and riparian areas. These sensitive water resource features include riparian areas, habitats of endangered species, streambeds, cultural resources, and wetlands. If these areas cannot be avoided, a qualified biological contractor shall conduct site-specific assessments for each affected site. These assessments shall be conducted in accordance with ACOE wetland delineation guidelines, as well as CDFG streambed and lake assessment guidelines, and shall include impact minimization measures to reduce wetland impacts to a less than significant effect (e.g., creation and restoration of wetlands). Though construction or maintenance vehicle access through shallow creeks or streams is allowed, staging/storage areas for equipment and materials shall be located outside of riparian areas. Construction of new access through streambeds that require filling for access purposes would require a Streambed Alteration Agreement from CDFG and/or consultation with the ACOE. Where filling is required for new access, the installation of properly sized culverts and the use of geotextile matting should be considered in the CDFG/USACOE consultation process.
55	An Erosion Control and Sediment Transport Control Plan would be included with the project grading plans submitted to San Diego County for review and comment. The sediment transport control plan would be prepared in accordance with the standards provided in the Manual of Erosion and Sedimentation Control Measures and consistent with practices recommended by the Resource Conservation District of San Diego County. Implementation of the plan would help stabilize soil in graded areas and waterways and reduce erosion and sedimentation. The plan would designate BMPs that would be implemented during construction activities. Erosion control efforts, such as hay bales, water bars, covers, sediment fences, sensitive area access restrictions (e.g., flagging), vehicle mats in wet areas, and retention/settlement ponds, would be installed before extensive soil clearing and grading begins. Mulching, seeding, or other suitable stabilization measures would be used to protect exposed areas during construction activities. Revegetation plans, the design and location of retention ponds and grading plans would be submitted to the CDFG and ACOE for review in the event of construction near waterways.

D.6.3.3 Proposed Miguel-Mission 230 kV #2 Project

Impact H-1: Soil Erosion, Water Quality Degradation and Sedimentation from Construction Activity and Access Roads

Construction of the overhead transmission lines would require excavation and grading for roads and transmission poles. Streams would be spanned by the overhead transmission lines. Removal of vegetation, soil disturbance and stockpiling of earth during construction could accelerate soil erosion, which would lead to sediments being washed into surface water. The following watercourses could be affected:

Sweetwater Reservoir, Steele Canyon Creek, Sweetwater River, Forester Creek, Coches Creek, San Diego River, San Vincente Creek, Eucalyptus Hills Creek East, and Eucalyptus Hills Creek West.

The recent fires that have occurred in the area have denuded portions of the Proposed Project route (see Section A.3), resulting in an increased potential for construction-related erosion in those areas. This increased risk will diminish as vegetation becomes re-established along the Miguel-Mission ROW.

SDG&E has proposed PP-6, PP-11, PP-35, PP-38, PP-39, PP-40, PP-41, PP-52, and PP-55 to reduce the erosion and sedimentation from construction. These measures require implementation of flood, erosion and sediment best management practices; avoidance of streambeds; obtaining NPDES clearance for construction activities; development of and adherence to a Storm Water Pollution Prevention Plan; avoidance of sensitive features including wetlands, waterbodies, and riparian areas; and development of and adherence to an Erosion Control and Sediment Transport Control Plan.

The Project Protocols are considered to be adequate to protect water quality in the project area, including the burned areas, where construction-related erosion is likely to be overshadowed by naturally occurring erosion from burned and denuded areas. No additional mitigation is necessary. Impact H-1 is considered adverse but less than significant (Class III).

Impact H-2: Degradation of Water Quality Through Spill of Potentially Harmful Materials Used in Construction

Accidental spills or disposal of potentially harmful materials used during construction could wash into and pollute surface waters or groundwater. Materials that could potentially contaminate the construction area from a spill or leak include lead-based paint flakes, diesel fuel, gasoline, lubrication oil, hydraulic fluid, antifreeze, transmission fluid, lubricating grease, and other fluids. The waters of the Sweetwater Reservoir, as well as all those listed in Section D.6.1, could receive contaminants should a spill occur. The potential for contamination of the Sweetwater Valley Groundwater Basin and the San Diego Groundwater Formation could also occur through infiltration of contaminated flows through the ground or stream beds.

SDG&E's PP-6, PP-11, PP-16, PP-38, PP-39, PP-52, and PP-55 are intended to reduce this potential impact. These measures specifically require the use of best management practices (BMPs) such as water bars, silt fences and staked straw bales, proper disposal of hazardous materials used in construction, development of and adherence to a construction SWPPP, avoidance of waterbodies and riparian areas where possible during construction, and compliance with RWQCB, USACE, and CDFG guidelines with regard to construction in or near waterbodies. These Project Protocols adequately protect water quality with regard to Impact H-2. No additional mitigation is necessary. Impact H-2 is considered adverse but less than significant (Class III).

Impact H-3: Groundwater Disturbance and Water Quality Degradation Through Project-Related Excavation

Contaminated soil or groundwater in the path of the project could be disturbed by excavation, resulting in a potential transfer of the contamination to surface waters. Spills of hazardous materials in excavated areas during construction could introduce contaminants to groundwater (see Section D.9). Groundwater flow in the San Diego Groundwater Formation and the Sweetwater Groundwater Basin could be disturbed by the project excavation.

Proposed Project excavation would consist primarily of drilling for the installation of new power poles. Foundation holes would be up to 8 to 9 feet in diameter and 20 to 40 feet in depth. Subsurface water

could be encountered in these excavations, particularly those in canyon bottoms. SDG&E's PP-16, which calls for proper disposal of hazardous materials used in construction, would reduce the risk of introducing contaminants to groundwater. Further, the best management practices required by the proposed SWPPP (PP-38 and PP-39) would ensure proper construction techniques in groundwater areas. With the implementation of the Project Protocols, and the localized nature of the excavation, Impact H-3 is classified as adverse but less than significant. No mitigation is required (Class III).

Impact H-4: Increased Runoff from New Impervious Areas

Construction of substation modifications, tower foundations, access roads, and pull site/laydown areas could result in additional runoff through the creation of impervious areas and compaction of soils. Impervious areas and compacted soils generally have higher runoff coefficients than natural areas, and increased flood peaks are a common occurrence in developed areas. However, the effect of creating compacted areas (e.g., in access roads) would be less than the effect of installing concrete or asphalt.

In the case of the Proposed Project, there may be small local increases in runoff in new impervious areas caused by installation of the power poles, road construction, and substation construction. Most roads will be unpaved and therefore pervious, resulting in little increase in runoff. Poles and new substation areas will comprise a very small portion of the watershed, less than one acre out of approximately 670 square miles for the San Diego and Sweetwater hydrologic units together, that overall runoff increase would be negligible. This impact would be adverse, but less than significant (Class III). No mitigation is required.

Impact H-5: Encroachment into a Floodplain or Watercourse by Permanent Aboveground Project Features

Encroachment of a project structure into a flow path of a watercourse 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-5 is likely to occur only if power poles or other permanent project features were constructed in a watercourse, as is the case of a 138 kV/69 kV pole that is proposed to be located adjacent to the Quail Canyon watercourse near the Sycamore Canyon confluence in the City of Santee. Although the pole would not be in the main watercourse, the watercourse exhibits signs of erosion that could capture this proposed pole, possibly resulting in the destabilization of the pole and accelerating erosion in the area. Mitigation Measure H-5a is recommended to ensure such construction does not occur without adequate protection to prevent damage from flooding and erosion. Implementation of Mitigation Measure H-5a would reduce this potentially significant impact to less than significant levels (Class II).

Mitigation Measure for Impact H-5, Encroachment into a Floodplain or Watercourse by Permanent Aboveground Project Features

H-5a **Aboveground structures shall be protected against flood and erosion damage.** Aboveground project features such as power poles, substations, and transfer stations shall be placed outside the current and reasonably expected future flow path of watercourses unless an engineering analysis, reviewed and approved by the CPUC and local jurisdictional authority (county or city) demonstrates that watercourse avoidance is not practicable, and that appropriate measures such as pole anchoring against stream scour, installation of bank protection, or raising foundations above flood levels, have been taken into account to identify and prevent potential flooding and erosion hazards. SDG&E shall document to the CPUC and local jurisdictions at least 60 days before the start of construction which structures, if any, would potentially be in flow

paths and what protective measures are proposed. An assessment of the reasonably expected future flow path of a watercourse shall take into account local topography and soils, past known erosion or meanders of a watercourse, and erosion trends exhibited by the stream.

Impact H-6: Construction in a Potential Dam Inundation Area

The Proposed Project would cross the Sweetwater River downstream of the Loveland Reservoir, as well as the San Diego River downstream of the Lake Jennings, El Capitan and San Vicente Reservoirs. The unlikely event of a dam failure would result in a dam-inundation floodplain crossing the project path. The Proposed Project would span the dam inundation area with overhead cables. Tower foundations within the dam inundation area could be affected by flowing water, which would cause scour issues around the base of the towers and poles. The likely worst-case consequences would be a destabilization of the power poles, which may result in temporary interruption of the power supply. Since the risk of dam inundation is considered low, and adverse environmental consequences low, this impact would be considered adverse but less than significant and no mitigation is required (Class III).

D.6.3.4 Future 230 kV Circuit within Miguel-Mission ROW

The future 230 kV circuit within Miguel-Mission ROW would consist of a second bundled 230 kV circuit in a vacant position on towers that would be in place at the time of construction. Impacts H-1, Soil Erosion, Water Quality Degradation and Sedimentation from Construction Activity and Access Roads, and H-2, Degradation of Water Quality Through Spill of Potentially Harmful Materials Used In Construction, apply in the same manner described in Section D.6.3.3 due to the construction of access roads, staging areas and pulling sites. Project Protocols would be the same as described in Table D.6-1 and would mitigate adverse water quality effects through the implementation of best management practices and development of and adherence to an SWPPP. Level of significance with Project Protocols is considered adverse but less than significant (Class III).

D.6.4 Project Alternatives

D.6.4.1 Jamacha Valley 138 kV/69 kV Underground Alternative

Environmental Setting

The Jamacha Valley 138 kV/69 kV Underground Alternative would run parallel to the Sweetwater River 100-year floodplain for a distance of approximately 3.5 miles, crossing one minor tributary to the Sweetwater River. Under this alternative, the 138 kV/69 kV circuits would be located underground along Willow Glen Drive, which is located above the Sweetwater Valley Groundwater Basin described in Section D.6.1.1. The segments north and south of Jamacha Valley for this alternative would be identical to the Proposed Project; Section D.6.1.1 provides a description of the baseline conditions for these areas. Since the unnamed tributary crossed by the Jamacha Valley 138 kV/69 kV Underground Alternative is also crossed by the Proposed Project route, no major stream crossings would be avoided by the Jamacha Valley 138 kV/69 kV Underground Alternative.

Environmental Impacts and Mitigation Measures

Impact H-3, Groundwater Disturbance and Water Quality Degradation Through Project-Related Excavation, applies in the same manner as for the Proposed Project, but the Jamacha Valley 138 kV/69 kV Underground Alternative would require trenching through an area overlying a portion of the Sweetwater Valley

Groundwater Basin. This linear trenching activity has the potential to create a conduit for groundwater, which may result in groundwater impacts. However, the risk of groundwater contamination is expected to be low because the excavation would be shallow and beneath an existing roadway, which is located above the 100-year flood level. Further, PP-16, PP-38, and PP-39 would ensure proper disposal of hazardous materials and proper construction techniques in groundwater areas. With the implementation of the Project Protocols, and considering the shallow depth of excavation, Impact H-6 is classified as adverse but less than significant with no mitigation required (Class III) for this alternative. Impact H-7 is added for this alternative.

Impact H-7: Exposure of the Underground Cable to Damage through Stream Scour and Erosion

As described above, this alternative would cross a tributary to the Sweetwater River. Segments of the underground cable placed below natural-bed streams, or adjacent to natural-bank streams could be exposed through scour or bank erosion. Exposure of the duct bank and cable could lead to power outages or shock hazard. However, these adverse impacts from stream scour issues are unlikely to occur because the cable would be placed in a concrete duct bank and protected by a roadway embankment. As a result, Impact H-7 is considered adverse but less than significant (Class III), and no mitigation is required.

Comparison to Proposed Project

This alternative would cross the same number of watercourses as the Proposed Project, in a very similar setting. The main difference between the Proposed Project and this alternative is that this alternative would run parallel to the Sweetwater River and would cross a tributary to the river in an underground cable rather than by overhead span. As a result, the potential for groundwater impacts, while less than significant, would be greater for this alternative. Construction-related water quality impacts would be reduced due to the avoidance of new power poles proposed along this segment of the ROW under the Proposed Project, and resulting avoidance of the need to construct access roads in those areas. This route has an additional impact (H-7), that is, not applicable to the Proposed Project, but it is considered less than significant (Class III).

Comparison to Proposed Project with Future Circuit

Impacts of installing a future 230 kV circuit on existing power poles or towers would be the same as those of the Proposed Project, as described in Section D.6.3.4. All additional impacts associated with the new circuit would be related to construction, access roads, staging areas and pulling areas, such as: Impacts H-1, Soil Erosion, Water Quality Degradation and Sedimentation from Construction Activity and Access Roads, and H-2, Degradation of Water Quality Through Spill of Potentially Harmful Materials Used In Construction. Since the amount of construction for this future circuit would be less than for the Proposed Project or Jamacha Valley 138 kV/69 kV Underground Alternative, level of significance with Project Protocols is considered adverse but less than significant (Class III). There is no appreciable difference between the addition of the future 230 kV circuit with the Jamacha Valley 138 kV/69 kV Underground Alternative as with the addition of same future circuit with the Proposed Project.

D.6.4.2 Jamacha Valley Overhead A Alternative

Environmental Setting

This alternative would be located within the same ROW as the Proposed Project, so the setting would be as described in Section D.6.1. As with the Proposed Project, it would cross the floodplains listed in Section D.6.1.4 and 16 unmapped drainageways (see Figures D.6-1a and D.6-1b). Groundwater along

this alternative would be from the Sweetwater Valley Groundwater Basin and the San Diego Groundwater Formation, described in Section D.6.1.2.

Environmental Impacts and Mitigation Measures

Impacts H-1 through H-6 apply as described for the Proposed Project in Section D.6.3, with the same impact classifications and for the same reasons. Impacts include soil erosion, water quality degradation and sedimentation from construction activity and access roads (Impact H-1), degradation of water quality through spill of potentially harmful materials used in construction (Impact H-2), increased runoff from new impervious areas (Impact H-4), encroachment into a floodplain or watercourse by permanent aboveground project features (Impact H-5), and construction in a potential dam inundation area (Impact H-6). All but Impact H-5 are considered adverse but less than significant (Class III) with implementation of Project Protocols. Impact H-5 would be mitigated to a less than significant (Class II) level by Mitigation Measure H-5a.

Comparison to Proposed Project

In comparison to the Proposed Project, this alternative would require construction or extension of access roads to the east side of the ROW and installation of poles to allow the circuit to cross the alignment. Impacts H-1 to H-4 would be incrementally greater due to the additional transition poles and the need to access sites on the eastern edge of the ROW; however, with the implementation of the Project Protocols these impacts would still be less than significant (Class III).

Comparison to Proposed Project with Future Circuit

There is negligible difference between this alternative with future 230 kV circuit and the Proposed Project with future 230 kV circuit.

D.6.4.3 Jamacha Valley Overhead B Alternative

Environmental Setting

This alternative would be located within the same ROW as the Proposed Project, with the setting described in Section D.6.1. As with the Proposed Project, it would cross the floodplains listed in Section D.6.1.4 and 16 unmapped drainageways (see Figures D.6-1a and D.6-1b). Groundwater along this alternative would be from the Sweetwater Valley Groundwater Basin and the San Diego Groundwater Formation, described in Section D.6.1.2.

Environmental Impacts and Mitigation Measures

Impacts H-1 through H-6 apply as described for the Proposed Project in Section D.6.3, with the same impact classifications and for the same reasons. Impacts include soil erosion, water quality degradation and sedimentation from construction activity and access roads (Impact H-1), degradation of water quality through spill of potentially harmful materials used in construction (Impact H-2), increased runoff from new impervious areas (Impact H-4), encroachment into a floodplain or watercourse by permanent aboveground project features (Impact H-5), and construction in a potential dam inundation area (Impact H-6). All but Impact H-5 are considered adverse but less than significant (Class III) with implementation of Project Protocols. Impact H-5 would be mitigated to a less than significant (Class II) level by Mitigation Measure H-5a.

Comparison to Proposed Project

In comparison to the Proposed Project, this alternative would require construction activities for 7 to 12 additional poles in the Jamacha Valley. Impacts H-1 through H-4 would be incrementally greater due to the addition of these poles; however, with the implementation of the Project Protocols these impacts would still be less than significant (Class III).

Comparison to Proposed Project with Future Circuit

There is negligible difference between this alternative with future 230 kV circuit and the Proposed Project with future 230 kV circuit.

D.6.4.4 City of Santee 138 kV/69 kV Underground Alternative

Environmental Setting

The City of Santee 138 kV/69 kV Underground Alternative runs underground in paved streets through a residential portion of the City of Santee. Two small drainageways, one contained in a storm drain and the other is in a relatively natural state, would be crossed underground by this modified route alternative. The natural drainageway is a new crossing not described in Section D.6.1. The remaining portion of this alternative outside the Santee 138 kV/69 kV underground line is identical to the Proposed Project, and the setting is the same as for the Proposed Project described in Section D.6.1.1. No major stream crossings would be avoided by the City of Santee 138 kV/69 kV Underground Alternative.

Environmental Impacts and Mitigation Measures

Impacts H-3 through H-7 would apply to the City of Santee 138 kV/69 kV Underground Alternative portion of this alternative in the same manner as described for the Jamacha Valley 138 kV/69 kV Underground Alternative, with the exception that the City of Santee 138 kV/69 kV Underground Alternative lies above the San Diego Groundwater Formation, not the Sweetwater Valley Groundwater Basin. However, it is unlikely that groundwater would be encountered during trenching because of the shallow depth of excavation. The Project Protocols would ensure proper construction techniques during shallow trenching activities. As a result, Impact H-3, related to potential groundwater contamination and disturbance, is considered adverse but less than significant (Class III). Impact H-7, related to stream scour, is considered potentially significant because a natural stream will be crossed by an underground cable. Although the watershed is small and the extent of stream scour and erosion likely low, Mitigation Measure H-7a is recommended to ensure impacts are mitigated to less than significant levels (Class II).

Mitigation Measure for Impact H-7, Exposure of the Underground Cable to Damage through Stream Scour and Erosion

H-7a **Underground cable shall be protected against scour and erosion.** At locations where the underground cable would cross below or pass adjacent to streams with erodible beds or banks, the burial depth shall be extended below the estimated 100-year depth of scour for that stream, or located at a sufficient distance from the bank as to avoid erosion that can reasonably be expected to occur during the life of the project. Proposed burial depths shall be submitted to the CPUC for review and approval at least 60 days before construction.

Comparison to Proposed Project

This alternative would cross one additional watercourse in comparison to the Proposed Project, in the same setting. The main difference between this alternative and the Proposed Project is in the City of Santee 138 kV/69 kV Underground Alternative segment, which runs underground through a residential area and crosses two small drainageways in an underground conduit rather than by overhead span. The potential for groundwater impacts are greater for the City of Santee 138 kV/69 kV Underground Alternative than for the Proposed Project, but construction-related water quality impacts would be less due to the avoidance of installing new poles and constructing new access roads in areas avoided by this route modification. This route has the potential to expose the underground cable to damage through stream scour and erosion (Impact H-7), but this impact would be less than significant with mitigation (Mitigation Measure H-7a). All impacts but Impact H-7 would be adverse but less than significant (Class III). Impact H-7 is considered less than significant with mitigation (Class II).

Comparison to Proposed Project with Future Circuit

Impacts of installing a future 230 kV circuit on power poles that would be in place at the time of construction would be the same as described in Section D.6.3.4. All additional impacts associated with the new circuit would be related to construction, access roads, staging areas and pulling areas, such as: Impact H-1, Soil Erosion, Water Quality Degradation and Sedimentation from Construction Activity and Access Roads, and Impact H-2, Degradation of Water Quality Through Spill of Potentially Harmful Materials Used in Construction. Since the amount of construction for this circuit addition would be less than for the Proposed Project, the level of significance with Project Protocols is considered adverse but less than significant (Class III). There is no appreciable difference between the addition of the additional 230 kV circuit with this alternative as with the addition of same with the Proposed Project.

D.6.4.5 City of Santee 230 kV Overhead Northern ROW Boundary Alternative

Environmental Setting

This alternative would be adjacent to the alignment of the Proposed Project in the City of Santee, with the setting described in Section D.6.1. As with the Proposed Project, it would cross the floodplains listed in Section D.6.1.4 and 16 unmapped drainageways (see Figures D.6-1a and D.6-1b). Groundwater along this alternative would be from the Sweetwater Valley Groundwater Basin and the San Diego Groundwater Formation, described in Section D.6.1.2. This alternative would occur near the urbanized northern edge of the City of Santee, to the east of Sycamore Canyon watercourse.

Environmental Impacts and Mitigation Measures

Impacts H-1 through H-6 apply as described for the Proposed Project in Section D.6.3, with the same impact classifications and for the same reasons. Impacts include soil erosion, water quality degradation and sedimentation from construction activity and access roads (Impact H-1), degradation of water quality through spill of potentially harmful materials used in construction (Impact H-2), increased runoff from new impervious areas (Impact H-4), encroachment into a floodplain or watercourse by permanent aboveground project features (Impact H-5), and construction in a potential dam inundation area (Impact H-6). All but Impact H-5 are considered adverse but less than significant (Class III) with implementation of Project Protocols. Impact H-5 would be mitigated to a less than significant (Class II) level by Mitigation Measure H-5a.

Comparison to Proposed Project

In comparison to the Proposed Project, this alternative would require the installation of two additional poles to transition the 230 kV circuit to the northern edge of the ROW. Impacts H-1 through H-4 would be incrementally greater due to the addition of these poles; however, with the implementation of the Project Protocols these impacts would still be less than significant (Class III).

Comparison to Proposed Project with Future Circuit

There is negligible difference between this alternative with future 230 kV circuit and the Proposed Project with future 230 kV circuit.

D.6.5 Environmental Impacts of the No Project Alternative

The No Project Alternative would consist of additional regional generation and/or CAISO-implemented congestion measures. Of these two components of the No Project Alternative, only additional regional generation would likely result in potential construction- and operations-related hydrology or water quality impacts. Although new power plants may be necessary in the San Diego area, their location and schedule for development cannot be predicted. However, general construction and maintenance activities associated with the new turbines could contaminate surface and groundwater if appropriate protective measures were not taken.

D.6.6 Mitigation Monitoring, Compliance, and Reporting Table

Table D.6-2 shows the mitigation monitoring, compliance, and reporting program for Hydrology and Water Quality.

Table D.6-2. Mitigation Monitoring Program – Hydrology and Water Quality

IMPACT H-5	**Encroachment Into a Floodplain or Watercourse by Permanent Aboveground Project Features (Class II)**
MITIGATION MEASURE	**H-5a: Aboveground structures shall be protected against flood and erosion damage.** Aboveground project features such as power poles, substations, and transfer stations shall be placed outside the current and reasonably expected future flow path of watercourses unless an engineering analysis, reviewed and approved by the CPUC and local jurisdictional authority (county or city) demonstrates that watercourse avoidance is not practicable, and that appropriate measures such as pole anchoring against stream scour, installation of bank protection, or raising foundations above flood levels, have been taken to identify and prevent potential flooding and erosion hazards. SDG&E shall document to the CPUC and local jurisdictions at least 60 days before the start of construction which structures, if any, would potentially be in flow paths and what protective measures are proposed. An assessment of the reasonably expected future flow path of a watercourse shall take into account local topography and soils, past known erosion or meanders of a watercourse, and erosion trends exhibited by the stream.
Location	All project-related structures within or adjacent to drainageways.
Monitoring / Reporting Action	Review and approve documentation and engineering analysis.
Effectiveness Criteria	Review and approve documentation and engineering analysis.
Responsible Agency	CPUC
Timing	60 days prior to construction
IMPACT H-7	**Exposure of the Underground Cable to Damage Through Stream Scour and Erosion (Class II)**
MITIGATION MEASURE	**H 7a: Underground cable shall be protected against scour and erosion.** At locations where the underground cable would cross below or pass adjacent to streams with erodible beds or banks, the burial depth shall be extended below the estimated 100-year depth of scour for that stream, or located at a sufficient distance from the bank as to avoid erosion that can reasonably be expected to occur during the life of the project. Proposed burial depths shall be submitted to the CPUC for review and approval at least 60 days before construction.
Location	City of Santee 138 kV/69 kV Underground Alternative; all underground cable crossings of drainageways.
Monitoring / Reporting Action	Review and approve documentation and engineering analysis.
Effectiveness Criteria	Review and approve documentation and engineering analysis.
Responsible Agency	CPUC
Timing	60 days prior to construction

D.6.7 References

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