BLUEWATER
RENEWABLE ENERGY STORAGE

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E
ENVIRONMENTAL REPORT
SECTION 1 – GENERAL SETTING

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

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Federal Energy Regulatory Commission
Project Number: P-14227
October 2022

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
		Paul Anderson			

Approval for issue

Paul Anderson		2022-10-20

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EXHIBIT E– SECTION 1 GENERAL DESCRIPTION OF LOCALE

As required under 18 CFR 4.41(f)(1), the Applicant is to provide a general description of the environment of the proposed project area and its immediate vicinity. The description must include location and generation information helpful to an understanding of the environmental setting.

1.0 GENERAL DESCRIPTION OF THE LOCALE

The following components of Applicant's Proposed Project are located within the San Jacinto and Santa Ana River watersheds: primary transmission line, Santa Rosa Substation, Powerhouse, and Decker Canyon Reservoir.

The San Jacinto River watershed covers more than 780 square miles of widely varying terrain. The basin is bounded by the Santa Ana Mountains (including the Elsinore Mountains, Santa Margarita, and the Santa Rosa Plateau) to the west and the more distant San Jacinto Mountains to the east and drains into Lake Elsinore (a naturally occurring graben lake). The Santa Ana River is the largest stream system in southern California. The Santa Ana River Basin covers an area of about 2,700 square miles in parts of Orange, San Bernardino, Riverside, and Los Angeles Counties.

Lake Elsinore is a natural low point in the San Jacinto River basin; it does not connect with the Santa Ana River in normal rainfall conditions. In high precipitation and runoff years, the San Jacinto River flows through Lake Elsinore to the Santa Ana River via Temescal Wash, a natural drainage system that extends about 28 miles from Lake Elsinore to the Santa Ana River, which eventually drains to the Pacific Ocean. Most of the river basin comprises chaparral vegetation and farming/ranching type land uses with increasing urban/residential and commercial land uses close to Lake Elsinore. Most of the mountain ranges are forested with major land uses including recreation, conservation, and residential housing. Traveling westward toward the coast, land uses generally become predominately urban.

Lake Elsinore is easily accessible via the Interstate 15 (I-15) Freeway. State Route 74 (SR-74 or Ortega Highway) connects the City of San Juan Capistrano (Orange County) to the I-15 (Corona or Escondido) Freeway on the east side of the Santa Ana Mountains (Riverside County).

The general Project area typically experiences warm, dry summers and mild, wet winters. The general climate is characterized as Mediterranean, with a mean annual temperature of 64 degrees (°) Fahrenheit (F). Most precipitation occurs during winter months with a mean annual precipitation of 11.7 inches. Precipitation increases sharply with rising elevations in the Santa Ana Mountains, such that the seasonal mean precipitation is about 25 inches only 1.5 miles from the shore of Lake Elsinore. Air quality in the area is good, and the area experiences a generally moderate eastward wind and weather pattern flow.

Please see Figure E.1-1 and Figure E.1-2 for the regional location and project location, respectively.

Detailed graphics showing the entire project may be found in Exhibit G of this Application Figure G–1 (Detailed Route Maps). Detailed proposed siting information of the primary transmission lines within the Cleveland National forest may also be found in Volume 3 of this application (Collaboration Between the Cleveland National Forest and Nevada Hydro).

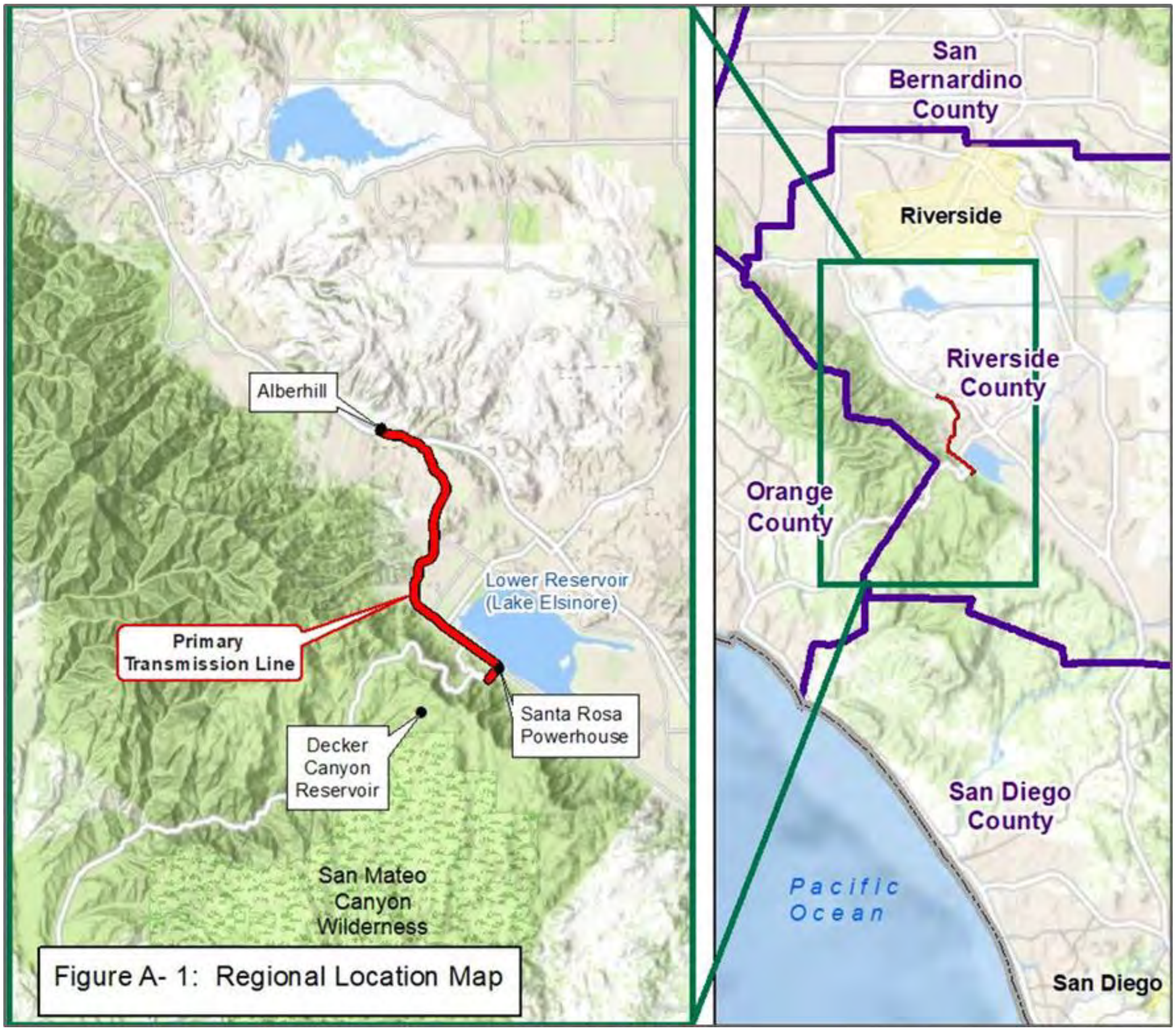

Figure E.1-1: Regional Location Map
Source: The Nevada Hydro Company

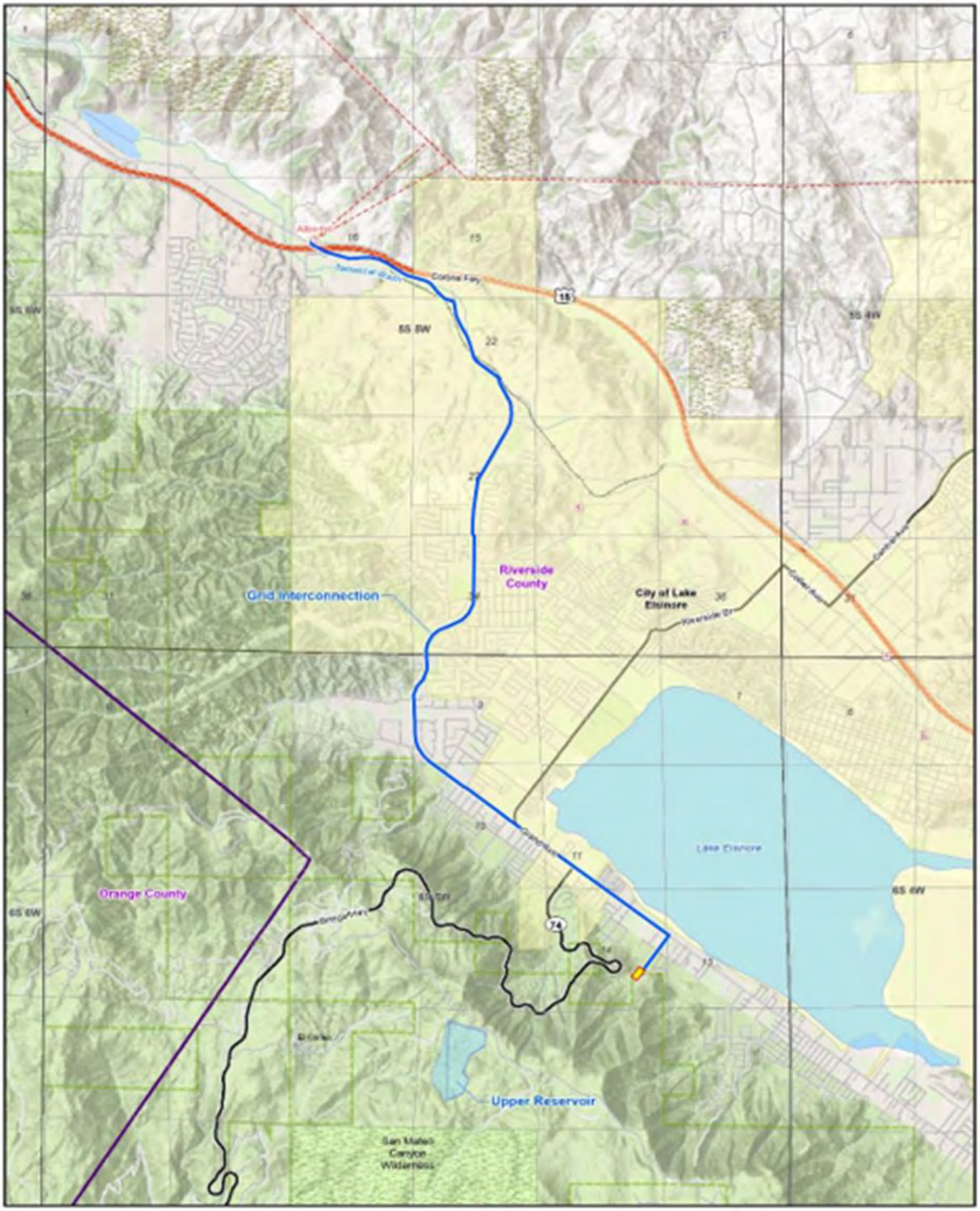

Figure E.1-2: Project Facilities Location Map
Source: The Nevada Hydro Company

1.1 General Regulatory Setting

As further noted in this amended application and the original September 2017 Final License Application (FLA), the information presented will be used by the CEQA Lead Agency in fulfillment of Federal (NEPA) and State (CEQA) environmental obligations. Specifically, Exhibit E (Environmental Report) in the FLA contains an extensive discussion of the existing environmental and State and Federal regulatory setting.[1]

The "Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858" (FEIS) and "Final Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58" (Sunrise FEIR/FEIS), inclusive of their environmental review records, provide additional supportable background information concerning the Project's existing environmental and regulatory setting. The FEIS for Project No. 11858 and the executive summary for the Sunrise FEIR/FEIS) are both available in Volume 3 of the FLA.

As indicated in the FEIS, the Applicant "has the opportunity to use this document, as appropriate, to satisfy its responsibilities under CEQA."[2] The information presented herein is not intended to conflict with that presented in the FEIS and/or Sunrise FEIR/FEIS with regard to the description of the Proposed Project or the description of the existing environmental and regulatory setting presented associated therewith or located herein.

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[1]/ As defined in Title 18, Section 380.2(f) of the Code of Federal Regulations (CFR), the "[e]nvironmental report or ER means that part of an application submitted to the [Federal Energy Regulatory] Commission by an applicant for authorization of a proposed action which includes information concerning the environment, the applicant's analysis of the environmental impact of the action, or alternatives to the action required by this or other applicable statutes or regulations."

[2]/ Federal Energy Regulatory Commission, Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, FERC/EIS-0191F, January 2007, p. 1-10.

BLUEWATER
RENEWABLE ENERGY STORAGE

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E
ENVIRONMENTAL REPORT
SECTION 2 – HYDROLOGY AND WATER QUALITY

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

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EXHIBIT E– SECTION 2 REPORT ON WATER USE AND QUALITY

As required under 18 CFR 4.41(f)(2), the Applicant must discuss water quality and flows and contain baseline data sufficient to determine the normal and seasonal variability, the impacts expected during construction and operation, and any mitigative, enhancement, and protective measures proposed by the applicant. The report must be prepared in consultation with the State and Federal agencies with responsibility for management of water quality and quantity in the affected stream or other body of water. The report must include:

(i) A description of existing instream flow uses of streams in the project area that would be affected by construction and operation; estimated quantities of water discharged from the proposed project for power production; and any existing and proposed uses of project waters for irrigation, domestic water supply, industrial and other purposes;

(ii) A description of the seasonal variation of existing water quality for any stream, lake, or reservoir that would be affected by the proposed project, including (as appropriate) measurements of: significant ions, chlorophyll a, nutrients, specific conductance, pH, total dissolved solids, total alkalinity, total hardness, dissolved oxygen, bacteria, temperature, suspended sediments, turbidity and vertical illumination;

(iii) A description of any existing lake or reservoir and any of the proposed project reservoirs including surface area, volume, maximum depth, mean depth, flushing rate, shoreline length, substrate classification, and gradient for streams directly affected by the proposed project;

(iv) A quantification of the anticipated impacts of the proposed construction and operation of project facilities on water quality and downstream flows, such as temperature, turbidity and nutrients;

(v) A description of measures recommended by Federal and State agencies and the applicant for the purpose of protecting or improving water quality and stream flows during project construction and operation; an explanation of why the applicant has rejected any measures recommended by an agency; and a description of the applicant's alternative measures to protect or improve water quality stream flow;

(vi) A description of groundwater in the vicinity of the proposed project, including water table and artesian conditions, the hydraulic gradient, the degree to which groundwater and surface water are hydraulically connected, aquifers and their use as water supply, and the location of springs, wells, artesian flows and disappearing streams; a description of anticipated impacts on groundwater and measures proposed by the applicant and others for the mitigation of impacts on groundwater.

2.0 HYDROLOGY AND WATER QUALITY

In response to issues raised by resource agencies and others, the Applicant contacted Professor Michael Anderson of the University of California, Riverside and requested that he review and provide comments on this section of the Application.[1] Dr. Anderson noted that numerous studies have been conducted since the original total maximum daily load (TMDL) for Lake Elsinore was developed over 20 years ago (as described herein) as part of compliance and other efforts, and that a revision to the TMDL is presently underway by third parties. A Memorandum was recently [1]developed between the Lake Elsinore and Canyon Lake TMDL Task Force and Executive Officer of the Santa Ana Regional Water Quality Control Board outlining incremental TMDL revisions.

Dr. Anderson further advised that what has been brought into sharper focus recently is the tremendous range of lake level, salinity and impacts of droughts. As an example, please see his technical memo (Surface Elevation and Salinity in Lake Elsinore: 1916-2014) contained in Volume 11 of 2017 FLA Application which should be viewed as just an example of work addressing longer-term variability in lake level and salinity. New insights have also been gained about the presence of toxin-forming algae in Lake Elsinore and concentrations of algal toxins that can approach advisory levels.

Dr. Anderson was not aware of new information about the upper watershed, San Juan and San Mateo Creeks, groundwater, etc. although deferred to others who may be more familiar with recent studies there.

However, and in general, he does not expect the potential impacts of the operation of the Project generation facilities to be substantially different based upon work conducted since the original application to FERC was developed.

Finally, Dr. Anderson noted, as the Applicant is well aware, that the water budget/availability issue is arguably the most acute issue facing the Lake. Droughts can be more extensive than had been really appreciated, conservation has altered water use patterns, and recycled water is increasingly highly valued, so identifying a reliable source of water for Lake Elsinore during periods of drought and maintenance of stable operating conditions are critical for the success of the project.

As a result of Dr. Anderson's comments, the Applicant intends to:

1. Focus on developing and securing supplemental water to maintain lake levels and help assure water quality and recreation benefits for Lake Elsinore, and
2. Work closely with stakeholders and Regional Board to help improve water quality in the lake and help it achieve compliance with TMDL goals

2.1 Introduction to the Topic

The Project area contains several distinct regional physiographic features, including the eastern slopes of the Santa Ana and Elsinore Mountains, the Perris Uplands, and the Elsinore-Temecula Trough. The Project area consists of gently rolling hills at the lower elevations and steeper slopes at upper elevations, ranging

[1]/ Dr. Anderson is a Professor Emeritus specializing in applied limnology and lake/reservoir management, surface water quality and modeling, fate of contaminants in soils, sediments and waters and environmental chemistry. He is a noted authority on Lake Elsinore.

[1] Key Principles for Potential Revision of the TMDL Technical Report: Revision to the Lake Elsinore and Canyon Lake Nutrient TMDLs (December 1, 2018) Memorandum Between the Lake Elsinore and Canyon Lake TMDL Task Force Members and Executive Officer for the Santa Ana Regional Water Quality Control Board August 2022

in elevation from 1200 to 3400-feet above msl. The proposed alignment of the primary transmission line is at the foot of northeast-facing slopes of the Santa Ana Mountains. The proposed Santa Rosa Substation, Powerhouse, and most of the primary transmission line occurs within the Elsinore-Temecula Trough, which runs along the northeast toe of the Santa Ana Mountains.

Climate in the Lake Elsinore area is semi-arid, with warm, dry summers and mild winters. Summer temperatures can exceed 100 degrees Fahrenheit but nights are generally cool. Annual precipitation averages 8-12 inches and annual evapotranspiration (ET) averages about 55 inches. A summary of monthly temperature and precipitation for the Lake Elsinore area, based on data spanning 57 years (1948-2005), is shown in Table E.2-1.

Table E.2-1: City of Lake Elsinore Climate Summary

Temperatures and Precipitation						
Month	Temperature (°F)			Precipitation (inches)		
	Mean	Avg Max	Avg Min	Avg	Max	Min
January	51.0	65.3	36.8	2.68	13.94	0.00
February	53.4	67.7	39.0	2.46	11.94	0.00
March	56.3	71/1	41.5	1.79	0.83	0.00
April	60.7	76.4	44.8	0.67	4.27	0.00
May	66.2	82.0	50.3	0.18	2.02	0.00
June	72.7	90.5	54.7	0.02	0.32	0.00
July	78.9	98.0	59.7	0.07	1.67	0.00
August	79.5	98.4	60.7	0.10	3.13	0.00
September	75.2	93.6	56.9	0.24	4.26	0.00
October	66.8	83.9	49.7	0.42	7.66	0.00
November	57.3	73.1	41.6	1.07	7.33	0.00
December	51.4	66.3	36.4	1.65	8.67	0.00
Annual	64.1	80.5	47.7	11.35	23.02	2.71

Source: National Weather Service Cooperative Station 42805 – Elsinore, 1948-2005

2.2 Hydrology and Water Quality Regulatory Setting

The following general discussion is presented of certain Federal, State, and local statutes and regulations that may be most applicable to an understanding of the Project's regulatory setting.

- Federal Clean Water Act. The Federal Water Pollution Control Act of 1972 (33 U.S.C. 1251 et seq.), known as the Federal; Clean Water Act (CWA), established a national policy designed to "restore and maintain the chemical, physical and biological integrity of the Nation's waters." The CWA requires states to develop water quality standards consisting of a detailed description of the hydrologic descriptions of the waterbodies, the beneficial uses which apply to each waterbody, and the water quality criteria (objectives) which will protect those uses. As specified, "[e]ach state must specify appropriate water uses to be achieved and protected. The classification of the waters of the state must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish, and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation (40 CFR 131.11[a]).

The CWA requires states to adopt (and the USEPA to approve) water quality standards for water bodies.[2] Water quality standards consist of designated beneficial uses for a particular water body, along with water quality criteria necessary to support those uses. Water quality criteria are prescribed concentrations or levels of constituents or narrative statements that represent the quality of water that supports a particular use. Because California has not established a complete list of acceptable water quality criteria, the USEPA established numeric water quality criteria for certain toxic constituents in the form of the California Toxics Rule (CTR) (40 CFR 131.38). Water bodies not meeting water quality standards are deemed "impaired" and, under Section 303(d) of the CWA, are placed on a list of impaired waters for which a TMDL must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, non-point, and natural sources that a water body may receive without exceeding applicable water quality standards (with a "factor of safety" included). Once established, the TMDL is allocated among current and future pollutant sources to the water body. TMDL is a number that represents the assimilative capacity of water for a particular pollutant or the amount of a particular pollutant that water can receive without impact to its beneficial uses.

The CWA effectively prohibits discharges of storm water from most construction sites unless the discharge is in compliance with a NPDES permit. The SWRCB is the permitting authority in California and has adopted a "General Permit for Stormwater Discharges Associated with Construction Activities" (General Permit)[3] governing storm water and authorized non-storm water flows from all construction sites one acre and larger throughout California. The General Permit requires construction-site operators to develop and implement a storm water pollution prevention plan (SWPPP) and an associated monitoring program and, for projects discharging directly into waters impaired due to sedimentation or involving potential discharge of non-visible contaminants that may exceed water quality objectives, a storm water sampling and analysis strategy (SWSAS) to meet CWA technology standards and to prevent construction sites from contributing to excursions of water quality standards.

- National Flood Insurance Reform Act. The Federal Emergency Management Agency (FEMA), a part of the Department of Homeland Security, prepares flood insurance rate maps (FIRM) in order to identify those areas that are located within the 100-year floodplain boundary,[4] termed "Special Flood Hazard Areas" (SFHAs). A 100-year flood does not refer to a flood that occurs once every 100 years but refers to a flood level with a one percent chance of being equaled or exceeded in any given year.[5] The SFHAs are subdivided into insurance risk rate zones. Areas between the 100 and 500-year flood boundaries are termed "moderate flood hazard areas." Areas located outside the 500-year flood boundary, are termed "minimal flood hazard areas."

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[2]/ In California, the USEPA has delegated responsibility for implementation of portions of the CWA to the State Water Resources Control Board (SWRCB) and its nine regional water quality control boards. The Regional Water Quality Control Board, Santa Ana Region (SARWCB) and the California Regional Water Quality Control Board, San Diego Region (SDRWQCB) are the local boards with jurisdiction over the Project sites.

[3]/ State Water Resources Control Board, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity, SWRCB Order No. 99-08-DWQ, NPDES No. CAS000002.

[4]/ As defined in the Standard Flood Insurance Policy (SFIP), "flood" is defined as "[a] general and temporary condition of partial or complete inundation of normally dry land areas from overflow of inland or tidal waters or from the unusual and rapid accumulation or runoff of surface waters from any source."

[5]/ Modern hydrologists define floods in terms of probability, as expressed in percentage rather than in terms of return period (recurrence interval). Return period (the N-year flood) and probability (p) are reciprocals, that is, p = 1/N. A flood having a 50-year return frequency (Q50) is commonly expressed as a flood with the probability of recurrence of 0.02 (2 percent chance of being exceeded) in any given year.

- Executive Order 11988 – Floodplain Management. Executive Order (EO) 11988 directs all Federal agencies to seek to avoid, to the extent practicable and feasible, all short- and long-term adverse impacts associated with floodplain modifications and to avoid direct and indirect support of development within 100-year floodplains whenever there is a reasonable alternative available.
- Cobey-Alquist Flood Plain Management Act. The Cobey-Alquist Flood Plain Management Act, codified in Sections 8400-8415 of the CWC, states that a large portion of land resources of the State are subject to recurrent flooding. The public interest necessitates sound development of land use, as land is a limited, valuable, and irreplaceable resource, and the floodplains of the State are a land resource to be developed in a manner that, in conjunction with economically justified structural measures for flood control, will result in prevention of loss of life and of economic loss caused by excessive flooding.

  The primary responsibility for planning, adoption, and enforcement of land-use regulations to accomplish floodplain management rests with local levels of government. It is the State's policy to encourage local government to plan land-use regulations to accomplish floodplain management and to provide State assistance and guidance.
- •California Water Code. The Porter-Cologne Water Quality Control Act (Division 1, Chapter 2, Article 3, Section 13000 et seq., CWC) (Porter-Cologne) constitutes a comprehensive plan for protecting the quality and maximizing the beneficial use of the State's waters.

  As specified therein, the State "Legislature finds and declares that. . . the quality of all the waters of the State shall be protected for use and enjoyment by the people of the state... activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable."[6] Under Porter-Cologne, the State's RWQCBs were required to: (1) formulate and adopt water quality control plans for all areas within the region;[7] (2) establish water quality objectives that "will ensure the reasonable protection of beneficial uses"[8] of State's waters; and (3) prescribe waste discharge requirements governing discharges to land and waters within the regions. Porter-Cologne establishes the principal California program for water quality control. Under Porter-Cologne, the SWRCB is mandated to implement the provisions of the CWA, which delegation is authorized by that Federal act.

  To implement and enforce the provisions of Porter-Cologne and the CWA, Porter-Cologne divides the State into nine regional boards that, under the guidance and review of the SWRCB, implement and enforce the provisions of both the State and Federal statutes. The Project is located within Region 8 (Santa Ana) and Region 9 (San Diego) and falls under the jurisdiction of the SARWQCB and SDRWQCB.

  As further indicated in the CWC, Section 100 declares that it is policy of the State that "the water resources of the state be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such water is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare." Under Section 13000, the Legislature declared that the people of the State have a primary interest in the conservation, control, and utilization of the water resources, and that the "quality of all the waters of the State shall be protected for use and enjoyment by the people of the state. The Legislature further finds and declares that activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be

[6]/ Section 13000, California Water Code.

[7]/ Section 13240, California Water Code.

[8]/ Section 13241, California Water Code.

made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible."

As specified in Section 13751, every person who digs, bores, or drills a water well, cathodic protection well, ground water monitoring well, or geothermal heat exchange well, abandons or destroys such a well, or deepens or reperforates such a well shall file with the California Department of Water Resources (Department) a report of completion within sixty days from the date that construction, alteration, abandonment, or destruction is complete. Section 13800.5(a)(1) further specifies that the Department shall develop recommended standards for construction, maintenance, abandonment, or destruction. Those standards are contained in the Department's "California Well Standards, Bulletin 74-90 (Supplement to Bulletin 74-81)."

- California Code of Regulations. The California Department of Health Services (DHS) is responsible for establishing uniform Statewide reclamation criteria to ensure that the use of recycled water is not detrimental to public health and protects beneficial uses. The existing DHS criteria include treatment requirements for recycled water used to create or augment recreational impoundments. In Title 22, Division 4, Chapter 3 (Water Recycling Criteria), the DHS sets forth water quality criteria, treatment process requirements, and treatment reliability criteria for reclamation operations. Section 60305 specifies that recycled water used as a source supply for non-restricted recreational impoundment shall be disinfected tertiary recycled water subjected to conventional treatment. Disinfected tertiary recycled water that has not received conventional treatment may be used for non-restricted recreational impoundment provided that the recycled water is monitored for the presence of pathogenic organisms in accordance with certain conditions. The degree of treatment specified represents an approximately 5-log reduction in the virus content of the water. The DHS has determined that this degree of virus removal is necessary to protect the health of people using the impoundments for water contact recreation. The DHS has developed wastewater disinfection guidelines[9] for discharges of wastewater to surface waters where water contact recreation (REC1) is a beneficial use. The guidelines recommend the same treatment requirements for wastewater discharges to REC1 waters as those stipulated in Title 22 for supply of recycled water to non-restricted recreational impoundments.

  Pursuant to Section 8589.5 of the CGC, inundation maps showing the areas of potential flooding in the event of sudden or total failure of any dam, the partial or total failure of which the Office of Emergency Services (OES) determines, after consultation with the California Department of Water Resources, would result in death or personal injury, shall be prepared and submitted to the OES. Sections 2575-2578.3 in Title 19 (Dam Inundation Mapping Procedures) establish State regulations in compliance therewith.

- California Fish and Game Code. The CF&GC contain several provisions that regulate nonpoint source discharges. As specified under Section 5650 of the CFGC, except as authorized by a State or Federal permit, "it is unlawful to deposit in, permit to pass into, or place where it can pass into the waters of this State" any "petroleum or residuary product of petroleum, or carbonaceous material or substance," any "sawdust, shavings, slabs, edgings," and any "substance or material deleterious to fish, plant life, or bird life."

- California Antidegradation Policy. California's Antidegradation Policy, formally known as the Statement of Policy with Respect to Maintaining High Quality Waters in California (SWRCB Resolution No. 68-16), restricts degradation of surface and ground waters. In particular, this policy protects waterbodies where existing quality is higher than necessary for the protection of beneficial uses.

[9]/ California Department of Health Services, Wastewater Disinfection for Health Protection, 1987.

Under the Antidegradation Policy, any actions that can adversely affect water quality in all surface and groundwaters must: (1) be consistent with maximum benefit to the people of the State; (2) not unreasonably affect present and anticipated beneficial use of the water; and (3) not result in water quality less than that prescribed in water quality plans and policies. Any actions that can adversely affect surface waters are also subject to the Federal Antidegradation Policy (40 CFR 131.12) developed under the CWA.

2.3 Surface Water

The proposed alignment of the primary transmission line crosses over an estimated 6 USGS-depicted blue-line (jurisdictional) drainages. Most of these drainages are considered ephemeral. The route of the primary line crosses the Temescal Wash south of the I-15 Freeway along Temescal Canyon Road near Alberhill. This watercourse contains consistent flowing water during the winter and spring seasons.

With respect to surface water hydrology, the environmental setting is further described below.

2.3.1 Lake Elsinore

Lake Elsinore is a natural lake and is about 5 miles long and 2 miles wide. The primary source of water to the lake is the San Jacinto River with a drainage area of about 723 square miles, which is the largest part of the 782 square mile drainage area to Lake Elsinore. The remaining watershed consists of smaller tributaries which flow directly into Lake Elsinore and direct rainfall on the lake surface. Canyon Lake (Railroad Canyon Reservoir), which has a storage capacity of about 12,000 acre-feet (AF) and a surface area of 525 acres is located along the San Jacinto River, about 3 miles upstream from Lake Elsinore. The Elsinore Valley Municipal Water District (EVMWD) operates the reservoir for water supply and storage of water purchased from the Colorado River. Spill from the Canyon Lake Dam into Temescal Creek is relatively rare due to the EVMWD's withdrawals and small inflow values. Spill events typically occur only during high runoff from winter storm events in extremely wet years.

Table E.2-2 provides flow data for USGS Gage No. 11070500 located about 2 miles downstream from the Canyon Lake Dam. Natural inflow to Lake Elsinore average 14,788 acre-feet per year (AFY).

Table E.2-2: Daily Discharge Statistics for San Jacinto River at Elsinore, California USGS Gage No. 11070500 (Water Years 1975 to 2016) (cfs)

Month	Mean	Maximum	Minimum	P10	P90
Annual	20.4	-	8,080.00		
January	43.71	0.15	4,490.00	0.56	36.74
February	101.10	0.17	8,080.00	0.68	146.95
March	68.35	-	5,350.00	0.72	191.68
April	13.40	0.01	365.00	0.40	57.87
May	6.13	-	490.00	0.16	14.72
June	0.83	-	17.00	0.00	2.37
July	0.31	-	3.37	-	1.02
August	0.23	-	3.62	-	0.65
September	0.25	-	3.13	-	0.70
October	2.17	-	1,010.00	0.03	1.02
November	1.18	-	305.00	0.17	1.43

December	7.07	-	3,040.00	0.46	2.88

Source: United States Geological Survey

Historically, the lake elevation was highly variable and has completely dried out including years 1850, 1880, 1954, and 1959 through 1963. As shown in Figure E.2-1, Lake Elsinore was very low or completely dry throughout most of the 1950's and 1960's. Conversely, Lake Elsinore spills into Temescal Creek only during extremely wet years (1919, 1981, 1983, 1993, and 1995) and has caused extensive flooding in the City during such periods.

Adjacent and located to the southeast of Lake Elsinore are three other water bodies: Back Basin, Lake Alpha, and Lake Beta. Back Basin is normally dry and is separated from Lake Elsinore by a 2.5-mile-long earthen berm constructed as part of the Lake Elsinore Management Project under the auspices of the U.S. Army Corps of Engineers (Corps), U.S. Bureau of Land Management (BLM), and Riverside County Flood Control District. This project was completed in the early 1990s to reduce evaporation losses from Lake Elsinore and provide additional flood storage, while improving water quality, habitat, and recreational opportunities associated with Lake Elsinore. The Back Basin berm has an overflow weir at elevation 1,262 feet msl at which point flow from Lake Elsinore enters Back Basin. Lake Alpha and Lake Beta are connected to Lake Elsinore by a 48-inch gated conduit in the levee. These two lakes form a wetland area and are effectively the low spots in the Back Basin.

An unfinished element of the Lake Elsinore Management Project is the establishment of a long-term supplemental water supply for the lake. Planners have determined that recycled water would be a preferred source over using scarce potable water for lake level stabilization.

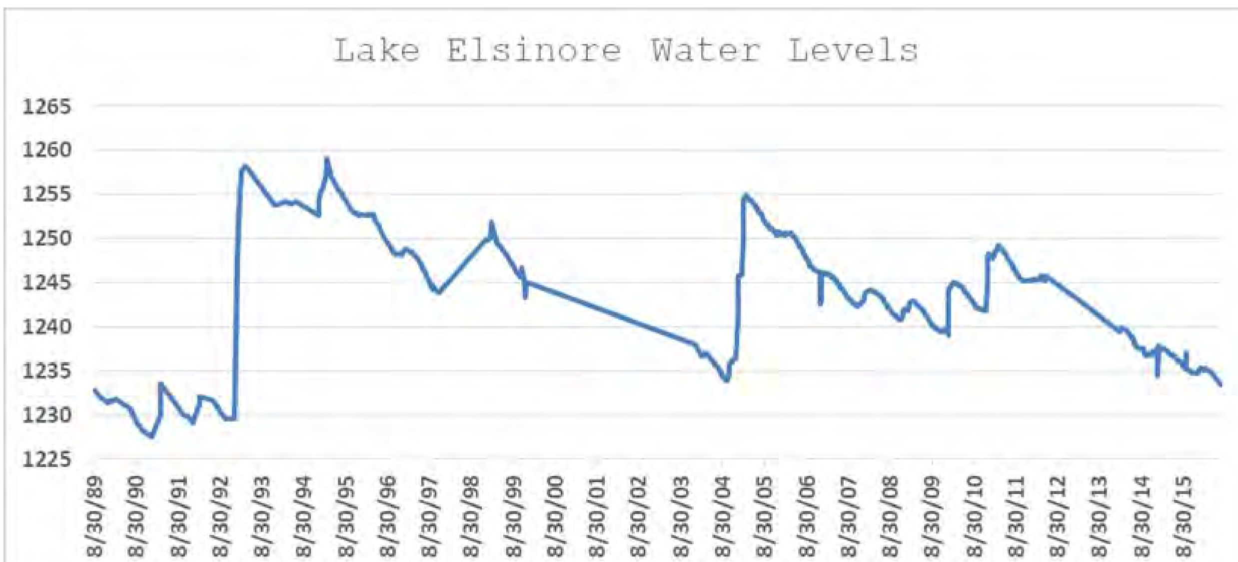

Figure E.2-1: Lake Elsinore Elevations
Source: Santa Ana Watershed Project Authority

To address this issue, the EVMWD and the City of Lake Elsinore formed a Recycled Water Task Force charged with determining public opinion on the use of recycled water to supplement Lake Elsinore that identified the desired actions and outcomes for the use of recycled water, and prepared a white paper on the topic. The task force published its findings in 1997 and concluded that recycled water may be acceptable for supplementing the water in Lake Elsinore provided that standards for disinfected tertiary treatment approved uses are met, nutrient removal to within the lowest natural background levels can be integrated into the next treatment plant upgrade, and a lake water quality monitoring program is implemented. Subsequently, the EVMWD implemented a feasibility study toward applying for a National

Pollution Discharge Elimination System (NPDES) permit and, along with the Eastern Municipal Water District (EMWD), began a pilot discharge project in June 2002. With discharge permits to add 4,480 AF of recycled water and up to 5,000 AF of groundwater (from the Island Wells) each year for two years, the pilot discharge project was intended to increase and stabilize lake levels and to test the effects of recycled water discharge on water quality and beneficial uses of the lake.

In July 2001, the Joint Watershed Authority filed a Notice of Intent to prepare a Programmatic Environmental Impact Report for the Lake Elsinore Stabilization and Enhancement Project. The stated objectives of this project are the following: (1) stabilization of water level of Lake Elsinore, by maintaining the lake elevation within a desirable operating range (minimum of 1240-feet to a maximum of 1247-feet above msl); (2) improvement of lake water quality (i.e., reduce algae blooms, increase water clarity, increase DO concentrations throughout the water column, and reduce or eliminate fish kills); and (3) enhancement of Lake Elsinore as a regional aesthetic and recreational resource. The Joint Watershed Authority approved the Lake Elsinore Stabilization and Enhancement Project in September 2005.

The primary source for make-up water is EVMWD's Regional Reclamation Plant[10] adjacent to Lake Elsinore. EVMWD relies on Water Rights Permit No. 30520 for an exclusive right to all water discharged from the reclamation plant. EVMWD also can supplement make-up water with water from its Island Wells. EVMWD and the Nevada Hydro Company (2005) determined that no water acquisition rights would be needed to purchase reclaimed water.

Substantial human actions in the watershed and Lake Elsinore itself affect the lake's inflow, elevation, and discharge. Water can flow out of Lake Elsinore through an outlet channel and into Warm Springs Creek and subsequently to Temescal Wash whenever the lake level exceeds 1255-feet above msl. This only occurs under torrential rainfall conditions or when an extended wet period results in abnormally high lake elevations. The bottom elevation of Lake Elsinore is 1,223 feet msl. At an elevation of 1240-feet above msl, Elsinore Lake has a surface area of 3,074 acres and stores 38,519 AF.

Historically, the lake elevation was highly variable and has completely dried out in certain years, including years 1850, 1880, 1954, and 1959 through 1963 (Dunbar, 1990, as cited in Joint Watershed Authority, 2005). Evaporation losses from Lake Elsinore are substantial, estimated at 56.2 inches per year, and are much larger than the average annual precipitation of 11.6 inches, which contributes to very unstable lake levels. Such evaporation losses translate to 15,500 AF per year, assuming a nominal elevation of 1245-feet above msl, which is an elevation that corresponds to a lake area of 3,319 acres.

Below Lake Elsinore, Temescal Wash flows about 28 miles in a northwesterly direction to its confluence with the Santa Ana River, just upstream of Prado dam (Joint Watershed Authority, 2005). Following the construction of the Back Basin berm and other improvements as part of the Lake Elsinore Management Project, Lake Elsinore has a 100-year flood elevation of 1263.3-feet above msl and a combined storage of about 150,000 AF, which includes the Back Basin (Joint Watershed Authority, 2005). Prior to this construction, in February 1980, a series of storms caused Lake Elsinore to rise to elevation 1265.7-feet above msl, causing substantial spill into Temescal Creek (personal communication, letter from R. Koplin, Chief, Engineering Division, S.C. Thomas, Senior Civil Engineer, Riverside County Flood Control District, dated August 15, 2003; USACE, 2003). After the flood control improvements were made, the highest peak flow recorded at USGS gage no. 11072100, Temescal Creek near the City of Corona, about 15 miles downstream from Lake Elsinore, was 4,030 cubic feet per second (cfs) on June 9, 2006 (USGS, 2005).

[10]/ EVMWD's Regional Wastewater Treatment Plant provides tertiary treatment to wastewater such that it can be reused in a variety of applications and is suitable for contact recreation.

Under normal conditions when Lake Elsinore is not spilling, Temescal Wash receives discharges of highly treated (tertiary) effluent from the EVMWD Regional Plant and excess recycled water from the EMWD Temescal Valley Water Reclamation Facility (MWH, 2005).

2.3.2 Decker Canyon Reservoir

The proposed Decker Canyon Reservoir site would be located on the west side of the Elsinore Mountains within the upper drainage of San Juan Creek which does not drain to Lake Elsinore. The Decker Canyon site is located at the headwaters of its drainage basin and would drain only about 90 acres (0.14 square mile). Below the Decker Canyon Reservoir site, San Juan Creek flows generally towards the west and has a 176 square mile drainage area at its point of discharge into the Pacific Ocean at Doheny State Park near Dana Point and Capistrano Beach in Orange County. Stream flows in the Decker Canyon site are seasonal and intermittent. San Juan Creek becomes perennial near the mouth of the basin, owing largely to development and urban runoff (about 35 percent of the watershed is urbanized), possibly due to effluent from waste water treatment plants and similar inflows during the dry season.

Streamflow in San Juan Creek since 1986 has been measured at USGS Gage No. 11046530, La Novia Street Bridge near San Juan Capistrano, which has a drainage area of 109 square miles. Table E.2-3 shows the annual stream flow data for this gage.

Table E.2-3: Daily discharge (cfs) statistics for USGS Gage No. 11046530 San Juan Creek at La Novia Street Bridge near San Juan Capistrano (Water Years 1987 to 2016) (cfs)

Mean	Maximum	Minimum	P10	P90
18.63	8120	0	0	9.6

Source: United States Geological Survey

2.4 Groundwater

The Project area is located within the South Coast Hydrologic Region. The South Coast Hydrologic Region has 56 delineated groundwater basins, eight basins of which are located in Subregion 8 (Santa Ana) and 27 basins are located in Subregion 9 (San Diego).

For the proposed northern primary transmission line, the area of the proposed Lake Switchyard is located within the Temescal Groundwater Subbasin (Basin No. 8.209). The subbasin underlies the southwest part of the upper Santa Ana valley. The Elsinore fault zone lies along the western boundary and the Chino fault zone crosses the northwestern tip of the subbasin. These fault zones are possible groundwater barriers. Dominant recharge is from percolation of precipitation on the valley floor and infiltration of stream flow within tributaries exiting the surrounding mountains and foothills.[11]

A portion of the proposed 230-kV transmission line upgrade traverses the San Luis Rey Valley Groundwater Basin (Basin No. 9.7). That groundwater basin underlies an east-west trending alluvium-filled valley in San Diego County. The major hydrologic feature is the San Luis Rey River which drains the valley overlying the basin. The basin is recharged by imported irrigation water applied on upland areas and by storm-flow in the San Luis Rey River and its tributaries. Movement of groundwater in the alluvial aquifer is westward towards the Pacific Ocean.[12]

The groundwater setting with respect to the pumped storage facility is described below.

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[11]/ *Id*., Upper Santa Ana Valley Groundwater Basin, Temescal Subbasin, updated January 20, 2006.

[12]/ *Id*., San Luis Rey Groundwater Basin, updated February 27, 2004.

2.4.1 Elsinore Groundwater Basin.

Lake Elsinore is located in the Elsinore Groundwater Basin (Basin No. 8-4). The basin underlies the Elsinore Valley in western Riverside County, and extends under a surface area of 40.2 square miles in Elsinore Valley. The basin is bounded on the southwest by the Santa Ana and Elsinore Mountains along the Willard fault, a play of the active Elsinore fault zone. The basin adjoins the Temecula Valley Groundwater Basin on the southeast at a low surface drainage divide. The basin is bounded on the northwest by the Temescal Sub-basin of the Upper Santa Ana River Valley Groundwater Basin at a constriction in Temescal Wash. The basin is bounded on the northeast by non-water-bearing rocks of the Peninsular Ranges along the Glen Ivy fault.

Lake Elsinore lies in a closed basin formed between strands of the active Elsinore fault zone. The principal recharge of the basin is from infiltration of stream flow through alluvial fan deposits near the edges of the basin and through gravel deposits along the course of the San Jacinto River. Other contributing sources include infiltration from unlined channels, underflow from saturated alluvium and fractures within the surrounding bedrock mountains, and spreading of water in recharge basins.[13] Additional information concerning the Elsinore Groundwater Basin is contained in the EVMWD's "Elsinore Basin Groundwater Management Plan."

Table E.2-4: Estimated Groundwater Basin Budget for the Elsinore Groundwater Basin

Location	Average Location (1990–2000) (acre-feet per year)
Inflows	
Precipitation infiltration from rural areas	2,000
Precipitation infiltration from urban areas	800
Recharge from San Jacinto River	1,700
Recharge from Lake Elsinore	0
Return flows from applied water	600
Return flows from septic systems	1,000
Return flows via subsurface inflow	0
Total inflows	6,100
Outflows	
Groundwater pumping	7,900
Surface outflow	0
Subsurface outflow	0
Total outflows	7,900
Net Deficit	1,800

Source: MWH, 2003, as cited in Joint Watershed Authority, 2005

Lake Elsinore is underlain by layers of clay, which greatly impedes the downward movement of groundwater because clay acts as an impervious barrier. Due to the geological layout and the surrounding faults, the Elsinore groundwater basin is essentially a closed groundwater basin. The groundwater level in the basin has dropped considerably, with estimates of at least a 100-foot drop having occurred in the first half of the twentieth century alone (Joint Watershed Authority, 2005). Until recently, in addition to

[13]/ *Id*., Elsinore Groundwater Basin, updated January 20, 2006.

groundwater withdrawal for irrigation and other needs, groundwater has been pumped from the EVMWD Island Wells, near Lake Elsinore to provide an additional source of water for Lake Elsinore under the pilot discharge project in an attempt to increase and stabilize lake levels. As indicated in Table E.2-4, an ongoing deficit of about 1,800 AF per year is estimated.

EVMWD developed a draft groundwater management plan for the Elsinore Basin, which was approved by its Board of Directors on March 24, 2005. The objective of the plan is to reverse the ongoing decline in groundwater levels and provide a long-term sustainable groundwater supply by recharging the basin with injection wells that would be located in the Lake Elsinore Back Basin and on the northwest side of the lake.

2.4.2 San Juan Creek Groundwater Basin.

The San Juan groundwater basin is a shallow basin that is essentially an underground flowing stream with limited storage capabilities. It is located under the San Juan Creek Watershed and tributary valleys in the southern part of Orange County, and is bounded to the west by the Pacific Ocean. Projects supporting groundwater recovery in the San Juan Creek groundwater basin have been initiated (Orange County, 2005).

The part of the groundwater basin near the area of the proposed Decker Canyon Reservoir site contains canyon bottomlands that are covered by alluvium and underlain by granitic bedrock. Evaporation amounts for the higher elevations associated with Decker Canyon Reservoir are estimated to be 38.2 inches per year, slightly lower than the 56.2 inches per year at Lake Elsinore.

With regard to San Juan Creek, the Corps notes that groundwater exists in a generally narrow, shallow alluvial valley fill that has been deposited in the San Juan Canyon area and its tributaries. Groundwater in these alluvial fill areas is unconfined. Groundwater studies indicate the alluvial fill ranges from reported depths of 200 feet at the coast to zero at the end of the small alluvial fingers tributary to the main canyons. The main structural feature influencing groundwater movement is the Cristianitos fault, which traverses the area in a north-south direction and crosses San Juan Canyon at a narrows, about 3.5 miles upstream from the confluence of San Juan and Trabuco Creeks. This fault and the narrows separate the groundwater alluvium into an upper and lower area.[14]

2.5 Water Quality

The proposed alignment of the transmission line crosses an estimated 6 USGS-depicted blue-line (jurisdictional) drainages. Most of these drainages are considered ephemeral. The route, however, crosses one major watercourse that contained flowing water during the Project’s general biological surveys (Temescal Wash). The Applicant is not aware of any available water quality data from Temescal Wash. With respect to the proposed generation facilities, water quality information is described below relative to existing water bodies and water quality constituents.

2.5.1 Lake Elsinore

Lake Elsinore’s morphology and location in a rapidly urbanizing area and upstream land use activities contribute to the quality of storm-water runoff that affects the water quality in the San Jacinto River and, ultimately, Lake Elsinore (Joint Watershed Authority, 2005). Consequently, the overall water quality of Lake Elsinore typically does not meet applicable water quality standards, and the California Regional Water Quality Control Board, Santa Ana Region (SARWQCB) has listed Lake Elsinore as impaired under

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[14]/ *Id*., San Juan Creek Watershed Management Study, Orange County, California, Feasibility Phase, Hydrology Appendix, p. 82.

Section 303(d)[15] of the Clean Water Act (CWA) for nutrients, organic enrichment/low dissolved oxygen (DO), sedimentation/siltation, and unknown toxicity.

Lake Elsinore water quality objectives are set by the SARWQCB and published in the "Santa Ana Basin Plan". According to the "Santa Ana Basin Plan," the existing beneficial uses within Lake Elsinore[16] include contact recreation (REC1), non-contact recreation (REC2), warm freshwater habitat (WARM), and wildlife habitat (WILD).

Table E.2-5 shows the beneficial use designation definitions. Table E.2-6 presents objectives for algae, temperature, turbidity, DO, pH, and total inorganic nitrogen.

Lake Elsinore is a large, shallow lake marking the terminus for flows in the San Jacinto River. Development throughout the watershed has led to stream diversions and groundwater withdrawals preventing surface flows from reaching Lake Elsinore in all but the wettest years. Its high evaporation rate (56.2 inches annual average) coupled with its low annual precipitation (11.6 inches annual average) and relatively small watershed area results in a shallow lake for most of the year (Joint Watershed Authority, 2005). Annual precipitation and runoff vary widely, and so do lake levels along with the amount of exposed shoreline. Throughout its history, Lake Elsinore has been subject to periods of extreme flooding or drying due to the semi-arid climate of the area and varying runoff amounts.

The quality of the lake is also a function of lake levels. As lake levels fall because of low inflow or high evaporative losses, lake constituents such as nutrients and salinity become concentrated, and DO falls as the temperature of the shallower water rises in the summer (Joint Watershed Authority, 2004). These conditions are accompanied by algal blooms that exacerbate DO depletion, odors, and fish kills.

2.5.2 San Juan and San Mateo Creeks

Surface water in the upper San Juan Creek Watershed in proximity to the proposed Decker Canyon upper reservoir site is intermittent and directly related to precipitation. Because of the natural setting, surface flows originating from the upper watershed are of good quality during the brief times there is runoff, which is typically during winter rainy season. This contrasts with conditions in the lower watershed near the coast as creek water (limited groundwater mixed with urban nuisance flows) is strongly influenced by the expansive urban development surrounding the lower reaches and is consequently considered impaired under Section 303(d) for pathogens (specifically coliform bacteria).

The San Juan Creek watershed is under the jurisdiction of the California Regional Water Quality Control Board, San Diego Region (SDRWQCB) and subject to provisions of the "San Diego Basin Plan". The designated beneficial uses of San Juan Creek include agricultural and industrial process supply, contact and non-contact recreation, warm and cold fresh water habitat, and wildlife habitat. Table E.2-6 presents objectives for algae, temperature, turbidity, DO, pH, and total inorganic nitrogen.

[15]/ Under Section 303(d) of the Clean Water Act, states are required to submit a list of waters for which effluent limits will not be sufficient to meet all state water quality standards. The 303(d) listing process includes waters impaired from point and non-point sources of pollutants. States must also establish a priority ranking for the listed waters, taking into account the severity of pollution and uses.

[16]/ In 1988, the SWRCB adopted the Sources of Drinking Water Policy (Resolution No. 88-63) that directed the SARWQCB and the SDRWQCB to add the Municipal and Domestic Supply (MUN) Beneficial Use for all waterbodies not already so designated, unless they met certain exception criteria. Lake Elsinore is excepted under this provision.

Table E.2-5: Beneficial Use Designation Definitions

Beneficial Use	Definition
AGR	Agricultural Supply waters are used for farming, horticulture, or ranching. These uses may include, but are not limited to, irrigation, stock watering, and support of vegetation for range grazing.
COLD	Cold Freshwater Habitat waters support coldwater ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
IND	Industrial Service Supply waters are used for industrial activities that do not depend primarily on water quality. These uses may include, but are not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well re-pressurization.
RARE	Rare, Threatened or Endangered Species waters support habitats necessary for the survival and successful maintenance of plant or animal species designated under state or Federal law as rare, threatened or endangered.
REC1	Water Contact Recreation waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, and use of natural hot springs.
REC2	Non-contact Water Recreation waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
SPWN	Spawning, Reproduction, and Development waters support high-quality aquatic habitats necessary for reproduction and early development of fish and wildlife.
WARM	Warm Freshwater Habitat waters support warmwater ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
WILD	Wildlife Habitat waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.

Source: California Regional Water Quality Control Board, Santa Ana Region; California Regional Water Quality Control Board, San Diego Region

Table E.2-6: Applicable Water Quality Objectives for Waters Potentially Affected by the Proposed Project

Parameter	Santa Ana Basin Plan Objective	San Diego Basin Plan Objective
Algae	Waste discharges shall not contribute to excessive algal growth in inland surface receiving waters.	Does not exist.
Temperature	The temperature of waters designated WARM shall not be raised above 90°F June through October or above 78°F during the rest of the year as a result of controllable water quality factors. Lake temperatures shall not be raised more than 4°F above	Natural water temperatures of basin waters shall not be altered unless it can be demonstrated to the satisfaction of the San Diego Water Board that such alteration does not affect beneficial uses.

Parameter	Santa Ana Basin Plan Objective	San Diego Basin Plan Objective
	established normal values as a result of controllable water quality factors.	
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: 0–50 NTUs not to exceed 20%, 50–100 NTU increases not to exceed 10 NTU, greater than 100 NTUs not to exceed 10%.	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Inland surface waters shall not contain turbidity in excess of 20 NTUs more than 10% of the time during any 1-year period.
Dissolved Oxygen	Depressed below 5 mg/l for waters designated WARM, as a result of controllable water quality factors. In addition, waste discharges shall not cause the median DO concentration to fall below 85% of saturation or the 95th percentile concentration to fall below 75% of saturation within a 30-day period.	DO concentrations shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters designated COLD beneficial uses. The annual mean DO concentration shall not be less than 7 mg/l more than 10% of the time.
pH	The pH of inland surface waters shall not be raised above 8.5 or depressed below 6.5 as a result of controllable water quality factors.	The pH value shall not be changed at any time more than 0.2 pH units from that which occurs naturally.
Total Inorganic Nitrogen	1.5 mg/l	Does not exist.

Notes:
mg/l – milligrams per liter;
NTUs – Nephelometric turbidity units

Source: Santa Ana Water Board, 1995; San Diego Water Board, 1994

- **Water temperature.** The SARWQCB and others have been involved in water quality monitoring since June 2002 as part of improvement projects as discussed in Section 3.2 (Cumulatively Affected Resources). Since 2002, vertical lake sample profiles were conducted at over 10 positions located throughout Lake Elsinore. Vertical profiles taken at sampling site 9 (the deepest sampling site located in the central part of the lake) show strong seasonal differences in temperature, with daytime surface summer water temperatures reaching 29 to 30° Celsius (C), while the lower water column was typically 25 to 27°C. A transition to cooler temperatures begins in the fall, with the surface temperatures cooling to approximately 20°C in October. Water column temperatures then cool further, with temperatures ranging from 12 to 14°C from November to March. The lake generally begins warming in April, with modest stratification present during this time, while strong heating and stratification were observed in late May to early June.

  Water temperature data for waters in Decker Canyon in the upper San Juan Creek Watershed we provided in docket P–11858, and reported temperatures between 13.3 and 17.0°C (4 field measurements taken April 28, 2005, after a precipitation event). No water temperature data were collected for waters in San Mateo Creek in the upper San Mateo Creek Watershed. Decker Canyon only experiences surface flows during precipitation events, and therefore temperature data could not be collected for Decker Canyon surface flows. Sampling to date has not isolated the difference between storm water and seepage. San Mateo Creek only experiences surface flows during storm events, and temperature data do not exist for this watershed.

- **Dissolved oxygen.** The SARWQCB has listed Lake Elsinore as impaired for failing to meet numerous Santa Ana Basin Plan objectives, including DO objectives. Measurements that are below state objectives are continually recorded throughout the water column for the majority of the year. Low DO levels in the lake result from aerobic decomposition of algae and other organic material in the bottom waters, nighttime respiration of phytoplankton, plankton blooms, and higher water temperature (warm water contains less oxygen than cold water) during summer months. The SARWQCB has developed and implemented measures from the draft Total Maximum Daily Load (TMDL) for nutrients to improve water quality and reverse the presently compromised conditions.

  DO levels within Lake Elsinore exhibit spatial and temporal trends that vary with lake temperature and depth, which are dynamic throughout the year. In August 2002, oxygen was substantially depleted across the lake, resulting in a fish kill (levels recorded below 1 milligram per liter (mg/l) in the lower third of the water column). As the lake began to mix in October and November 2002, the lake generally exhibited higher concentrations but still reduced DO levels (5 mg/l) near the sediments relative to the surface (8 to 10 mg/l). This period of mixing was followed by a sharp decline in DO throughout the water column in early December 2002. Conversely, Lake Elsinore was generally well oxygenated during the winter of 2003. Historically, DO levels have been observed between 0.1 and 16 mg/l and vary greatly with season, temperature, and depth.

  The Applicant collected a single DO measurement of 8.9 mg/l from a sample collected from Decker Canyon in April 28, 2005. No DO data exist for waters in the upper San Mateo Creek Watershed. San Mateo Creek Watershed, due to its relative similarity (intermittent, upper-watershed setting in the same southern California mountain range) to Decker Canyon is assumed to exhibit similar water quality traits. As such, water (when present) within these upper watersheds is likely to be well oxygenated.

- **Nutrients.** The SARWQCB recognizes that the narrative water quality objectives set to protect the beneficial uses of Lake Elsinore are not being met as a result of high nutrient concentrations stimulating excessive algae growth and compromising DO levels. As such, Lake Elsinore is listed as impaired under Section 303(d) for nutrients, and this impairment requires the establishment of a TMDL for the pollutants causing the impairment (nitrogen and phosphorus).

  Lake Elsinore is technically eutrophic in that it exhibits the following characteristics: (1) large algae blooms (chlorophyll-a >50 micrograms per liter [µg/l]) and common presence of blue-green algae (cyanobacteria), specifically Microcystis; (2) large seasonal and daily swings in concentrations of DO; anoxic values that have been recorded in deeper waters during most summers; (3) low water clarity; Secchi disc values less than 1 meter; (4) high concentrations of inorganic nitrogen; and (5) high concentrations of total phosphorus. These observations substantiate the pilot "Lake Elsinore Recycled Water Project," an effort that enables EVMWD to discharge treated wastewater into Lake Elsinore to maintain higher lake levels to minimize effects from high evaporative losses and low inflow rates. This effort is designed to help restore the water quality of Lake Elsinore to meet state objectives.

  Sampling results show that the total phosphorus concentration in Lake Elsinore has generally been increasing between 2002 and 2004. Total phosphorus concentrations vary with the season but were generally observed at approximately 0.3 mg/l throughout the second half of 2002 and rising to approximately 0.5 mg/l in early 2004.

  Total nitrogen concentrations were variable between 2000 and 2004. Average summer concentrations were approximately 3.0 mg/l in 2000 and 2001 rising to approximately 5.0 mg/l in 2002 and 2003. Winter total nitrogen concentrations for all sampled sites from 2003 to 2004 averaged 11.8 mg/l; however, data presented by the Applicant exhibit considerable variability between days and pronounced swings seasonally and annually.

Sampling information provided in Docket P–11858 indicated that the total nitrogen: total phosphorus ratio was variable since sampling began in summer 2000. From summer 2000 through summer 2002, there were periods of strong phosphorus limitation (ratios up to 50:1), interrupted with periods during the winter of co-limitation (~15:1) and brief periods of nitrogen limitation (~5:1). The general trend has been moving toward nitrogen limitation.

Field sampling was conducted by the Applicant to characterize the waters of Decker Canyon following a precipitation event. The total nitrogen concentration below the Decker Canyon upper reservoir site was reported at 1.4 mg/l. All other samples were below the reporting limit.

- **Algae.** (Chlorophyll and Transparency). According to the SARWQCB, hyper-eutrophication (over enrichment of nutrients) of nitrogen and phosphorus is the most severe water quality problem in Lake Elsinore (SARWQCB, 2001). These elevated nutrient concentrations cause algae blooms that also result in low DO levels, which further result in fish kills. The presence of unsightly amounts of algae conflicts with the beneficial uses of Lake Elsinore, specifically WARM, REC-1, and REC-2, and is directly linked to the implementation of the nutrients TMDL. Chlorophyll concentrations show a slight seasonal trend with peaks in the late spring-summer. The SARWQCB recorded a maximum concentration of about 400 µg/l in fall 2002; however, 200 µg/l is a more typical concentration observed since 2003. Algae blooms are known to occur in the lake and result in floating mats of algae. These blooms typically occur in the summer to fall season but could potentially occur at anytime during the year when there are sufficient nutrients and ample sunlight. Secchi depths, an indicator of the lake's transparency, have been relatively stable at approximately 0.2 meter.

  Samples from the San Juan Creek and San Mateo Creek watersheds are not available to include in this discussion. Given the remote nature and the intermittent nature of the waters potentially affected by the Project and the low nutrient concentrations observed in field samples, it is unlikely that large amounts of algae as a result of nutrient enrichment would compromise the waters.

- **pH.** The SARWQCB sampling program has observed that the pH of Lake Elsinore has averaged slightly greater than 9 between April 2002 and June 2004, although the pH profiles show some vertical and temporal trends. The range of pH values recorded during this time period is 8.7 to 9.5. High pH values are often the result of the respiration of aquatic organisms (e.g., algae). The build-up of carbon dioxide in the water leads to a chain of chemical reactions that ultimately increase the alkalinity of the water (increased pH). The Applicant reported pH values between 7.42 and 7.65 from samples taken in Decker Canyon in December 2004 and April 2005 shortly after rain events. Information about the water quality of upper San Mateo Watershed is not available, but is likely to be similar to the waters in the upper San Juan Watershed.

Table E.2-7: San Juan Basin Water Quality Data (mg/l)

Subbasin	TDS	SO3	Iron	Mn
Lower San Juan	1500-2000	500-750	>2.0	0.5-1.5
Middle San Juan	500-1000	250-500	0.3-2.0	0.5-1.5
Upper San Juan	0-500	0-250	0-0.3	0-0.05

Source: Capistrano Valley Water District

The groundwater in the San Juan Creek watershed is typically high dissolved solids and salts. Table E.2-7 provides general groundwater quality data for 1987.[17] In general, groundwater quality problems

[17]/ *Id*., p. 84.

in the San Juan Creek watershed are related to high dissolved solids content, rather than bacteriological, toxins, or heavy metal concentrations.[18]

2.6 Potential Impacts on Water Resources

Impacts on water resources attributable to the Project generation facilities are discussed in Section 2.6.1. Impacts on water resources associated with the primary transmission connection are presented in Section 2.6.2. Potential cumulative impacts on water resources relating to the Project (inclusive of both transmission and generation) are presented in Section 2.6.3.

2.6.1 Potential Impacts of Project Generation Facilities

Lake Elsinore is a natural lake which is about five miles long and about two miles wide. It is a terminal lake and a natural low point in the San Jacinto River Basin; it does not connect with the Santa Ana River under normal rainfall conditions. In high precipitation and runoff years, the San Jacinto River flows through Lake Elsinore to the Santa Ana River via Temescal Wash, a natural drainage system that extends about 28 miles from Lake Elsinore to the Santa Ana River, which eventually drains to the Pacific Ocean. Lake Elsinore has overflowed to the northwest through Walker Canyon very rarely, only three times in the 20th Century and 20 times since 1769 based on Mission diaries. Each overflow event was short-lived demonstrating that Lake Elsinore is essentially a closed-basin lake system (FERC, 2007).

Lake Elsinore is an ephemeral lake, and water surface elevations have historically experienced significant fluctuations due to periods of flooding followed by prolonged dry periods. Lake Elsinore has dried completely on four occasions since 1769 (TNHC, 2007). Lake Elsinore has a relatively small drainage basin (<1,240 square kilometers) from which the San Jacinto River flows (semi-annually) into and terminates within the lake's basin. Lake Elsinore is a shallow lake (average depth of 24.7 feet) with a large surface area: (approximately 3,074 acres at elevation 1240-feet above msl). The main natural sources of water flowing into Lake Elsinore are direct natural runoff from the surrounding mountains and drainage from the San Jacinto River.

Annual average precipitation in the Lake Elsinore watershed is about 11.6 inches and the average annual evaporative loss is 56.2 inches. This excessive evaporative loss, when compared to the low natural inflow, results in unstable lake levels.

The primary source for make-up water is the EVMWD's Regional Water Reclamation Facility (RWRF), located adjacent to Lake Elsinore. The EVMWD relies on Water Rights Permit No. 30520 for an exclusive right to all water discharged from the reclamation plant. The EVMWD also can supplement make-up water with water from its island wells. The Applicant is also in discussions with the Eastern Municipal Water District (EMWD) as a potential supplier of tertiary treatment water that could be secured for discharge into Lake Elsinore. Water from those or other sources could be secured by the Applicant for Project operations.

Lake Elsinore has a long history of water quality problems, the most severe of which is hypereutrophication or the over-enrichment of the lake with the nutrients phosphorus and nitrogen. Elevated nutrient levels result in high algal productivity, leading to algal blooms that block sunlight to the water column and reduce photosynthesis of aquatic plants, creating low dissolved oxygen (DO) levels that result in periodic fish kills. The majority of oxygen produced by algal respiration is lost to the atmosphere rather than being dissolved in lake water. The decay of floating mats of algae is a chemical process that

[18]/ *Id*., San Juan Creek Watershed Management Plan, p. III-7.

further removes DO from the water column, exacerbating low oxygen levels experienced by the turbid water. The shallow lake depths and large surface area of Lake Elsinore allows water temperatures to increase dramatically during the summer months and high water temperatures support lower levels of DO. These complex processes result in excessive oxygen depletion that adversely affects aquatic biota, including fish.

Nutrient levels are elevated in Lake Elsinore from a combination of natural and anthropogenic causes. Nutrients tend to build up in terminal lake bottoms. Lake Elsinore is essentially the endpoint of a closed hydrologic system. Nutrient runoff from surrounding urban development, faulty septic systems, and dairy and agricultural operations contributes to the nutrient loading problem in Lake Elsinore. In addition, nutrient-rich sediment at the lake bottom is stirred up by the burrowing and bottom foraging behavior of introduced carp. Under conditions of low DO, phosphorus trapped in suspended sediment becomes bio-available to algae.

Lake Elsinore is listed by the State as “impaired” per Section 303(d) of the Clean Water Act (CWA) for failing to meet applicable water quality objectives, including DO levels. Measurements that are below State water quality objectives are continually recorded throughout the water column in Lake Elsinore for the majority of the year. The Lake Elsinore and San Jacinto Watershed Authority (LESJWA) installed a “lake mixing system” (axial flow pump aeration system) in 2004 and has initiated an environmental review process for an “aeration project” (diffused air in-lake aeration system) designed to increase oxygen levels in Lake Elsinore.

Pumped-storage electrical generation operations would involve the cycling of water between Lake Elsinore and a new upper reservoir, generating power with releases from the upper reservoir to Lake Elsinore and returning water to the upper reservoir for storage. This closed-loop cycling operation would be accompanied by upper reservoir water-level fluctuations of about 40 feet on a daily basis and about 75 feet during the course of a full-week cycle. In Lake Elsinore, the daily water-level fluctuation would be about one foot, with the lake level fluctuating about 1.7 feet during the course of a weekly cycle.

Significant hydraulic modification has already occurred in Lake Elsinore. However, potential effects during construction will include greater-than-normal lake-level draw downs to facilitate construction and initial filing. This would be a short-term impact and the drawdown elevation would largely be dictated by the hydrologic conditions present at that time. About 5,500 acre-feet (AF) of water would be needed for the initial filling of the upper reservoir. Since the Applicant proposes to obtain this water from recycled water sources available to the EVMWD and/or EMWD, effects on local potable water supplies would be negligible. Water use during construction is also a short-term impact and the Applicant would purchase the water needed from the EVMWD, the EMWD, or from other sources.

Construction of the intake/outlet structure would require work to be performed in Lake Elsinore. This work would be conducted within the confines of a cofferdam, which would limit the interface between the construction activities and lake water. Installation of the intake/outflow structure would require the removal of lake bed material which would be replaced with a steel and concrete structure. The structure would be backfilled and secured prior to removal of the cofferdam. Once the cofferdam is removed, the lake bed would be re-submerged. Based on the findings of technical studies conducted by the SARWQBC, construction activities are not anticipated to significantly disturb or re-suspend lakebed sediments (Anderson, 2006, 2007a, 2007b).

Table E.2-8 summarizes the potential water resource impacts of the Project.

Applicable PMEs which serve to mitigate potential hydrology and water quality impacts attributable to the Proposed Project are presented in Table E.2-11.

Table E.2-8: Potential Project Impacts on Water Resource

Impact	Description
H-3	Excavation could degrade groundwater quality in areas of shallow groundwater.
H-6	Accidental releases of contaminants from project facilities could degrade water quality.
H-7	Project construction or operation would potentially impact local water supply.
H-8	Project construction would deliver sediment resulting in increased turbidity.
H-9	Project reservoir would capture runoff.
H-10	Project operations could impact the quantity and quality of groundwater recharge.
H-11	Project operations could change water quality parameters.
H-12	Project operations could degrade water quality in San Juan Creek.

Source: The Nevada Hydro Company, Inc.

Impact H-3: Excavation could degrade groundwater quality in areas of shallow groundwater.

Construction of the Project Powerhouse, subsurface penstocks, and other associated electrical and water conduits (e.g., power shafts, power tunnels, penstocks, tailrace tunnels, and inlet/outlet structures) could intercept groundwater and daylight water now stored in underground aquifers. If substantial quantities of groundwater were to be encountered, both upslope and downslope areas can realize a decline in groundwater levels. A number of rural residents located within the Congressional boundaries of the CNF rely upon groundwater wells as their sole water source. Any loss of or disruption to groundwater supplying those wells could substantially affect those residents. This impact is potentially significant but would be mitigable to a less-than-significant level with the implementation of PME's H-3b and H-3c located inTable E.2-11.

Impact H-6: Accidental releases of contaminants from project facilities could degrade water quality.

Construction activities, including the construction of the new Decker Canyon Reservoir and an intake/outlet structure in Lake Elsinore, would require the placement, consumption, and storage of fuels, oils, lubricants, and other petroleum products and hazardous materials near existing water resources. The release or spill of petroleum products and/or hazardous substances into surface waters or streams located proximal to construction, operation, or maintenance activities could have negative effects on water quality, including corresponding impact on terrestrial and aquatic resources.

Lake Elsinore is a hypereutrophic lake and listed by the State as "impaired" under Section 303(d) of the CWA for failing to meet applicable water quality objectives for nutrients, organic enrichment/low DO, sedimentation/siltation, and unknown toxicity. The release of additional hazardous substances could exacerbate this condition. This impact is potentially significant but would be mitigable to a less-than-significant level through the development, implementation, and enforcement of a hazardous substances spill prevention and control plan, environmental safety plan, and hazardous substances response plan (PME H-7). In addition, implementation of PMEs H-2a, H-2b, H-2c will provide controls over the transport, use, storage, and disposal of hazardous materials and petroleum products associated with Project construction, operation, and maintenance activities.

Impact H-7: Project construction or operation would potentially impact local water supply.

Extensive tunneling will be required to construct the penstocks connecting the new Decker Canyon reservoir and the Powerhouse. Excavation activities associated with that tunneling could encounter and destabilize artesian groundwater systems. In addition, excavation for reservoir construction and the placement of a seepage collection system could destabilize localized artesian groundwater. Groundwater extent, including the depth to any underlying aquifer and hydrostatic pressures, will be determined through subsequent hydrogeologic investigations conducted by the Applicant prior to the start of construction (FERC, 2007).

Dewatering (groundwater pumping for construction) would likely be necessary for construction of the penstocks, tailrace tunnels, and intake/outlet structure; however, the effect is likely to be localized and for a short duration until a shaft casing could be installed. Long-term effects on the local and regional groundwater, such as the lowering of the piezometric surface, are not anticipated for the construction, operation, or maintenance of the proposed powerhouse, penstocks, tailrace, and intake/outlet structures. Additional groundwater level monitoring and geotechnical investigations will be conducted by the Applicant prior to the start of construction (FERC, 2007).

There are approximately 600 residents living downstream near the Ortega Highway–San Juan Creek crossing. The water source of these residents is dominated by groundwater supplies (FERC, 2007). Any disruption of the groundwater that serves those residents or any interruption to existing groundwater seeps discharging groundwater to the surface would be a potentially significant impact but would be mitigated to a less-than-significant level through compliance with FERC/USDA Forest Service requirements and implementation of PMEs H-3b and H-3c located in Table E.2-11.

Impact H-8: Project construction would deliver sediment resulting in increased turbidity.

Construction could increase turbidity in area streams and in Lake Elsinore through two primary pathways: (1) increased surface erosion; and (2) in-water construction activities. Construction activities could affect temperature, DO, and nutrient cycling and would likely contribute to continued and overall poor water quality in Lake Elsinore. Construction of the proposed Decker Canyon Reservoir would necessitate the removal of existing vegetation covering an approximately 150-acre area, exposing soils to increased erosion. Increased sediment loading in Decker Canyon would discharge to San Juan Creek. These impacts are significant but would be mitigable to a less-than-significant level through compliance with FERC/USDA Forest Service requirements and the implementation of PME H-1d, H-1e, and H-1f located in Table E.2-11.

Impact H-9: Project reservoir would capture runoff.

The San Juan Creek watershed encompasses a drainage area of 176 square miles (113,000 acres) extending from the CNF to the Pacific Ocean at Doheny State Beach, near Dana Point Harbor. The proposed approximately 100-acre Decker Canyon Reservoir is located in that watershed and captures a surface area representing less than 0.1 percent of that drainage basin.

Through the inclusion of a double-liner system (low-permeability liner material and a geomembrane) and collection system, the proposed Decker Canyon Reservoir is designed to preclude water retained in the reservoir (water imported from Lake Elsinore) from discharging to the San Juan Creek watershed. As a result, rainwater falling into the reservoir will also be contained therein.

The presence of the reservoir would preclude this captured water from flowing downstream into the San Juan Creek watershed. Interception of rainfall by the uncovered reservoir would be expected to be minimal on a watershed level. It is estimated that precipitation over the Decker Canyon Reservoir could contribute as much as 135 acre-feet per year (AFY) during an average year to the San Juan Creek watershed. This amounts to about one percent of the average runoff as measured at the La Novia Street Bridge Gage, approximately 17 miles downstream.

This resulting impact is less than significant and no mitigation is required.

Impact H-10: Project operations could impact the quantity and quality of groundwater recharge.

Operational waters used to generate at the proposed Project Powerhouse will be pumped from Lake Elsinore (Santa Ana Basin) into the proposed Decker Canyon Reservoir. The installation of a double-liner (low-permeability liner material and a geomembrane) and collection system and the maintenance of adequate freeboard at the proposed upper reservoir will maintain separation between the water within the reservoir and the surface and groundwater of the San Diego Basin, thus preventing any chemical constituent and biological transference between those basins. Experience with liners of the type proposed shows that leakage or failure would be unlikely. However, if the liner and collection system were to leak or otherwise fail, there could be a release of water originating from Lake Elsinore (Santa Ana Basin) into the surface waters of San Juan Creek (San Diego Basin), which could then infiltrate into groundwater supplies.

No planned releases of water from the Decker Canyon Reservoir to San Juan Creek are proposed. Unplanned releases, as may be associated with a failure of the retention and/or collection systems, would temporarily affect surface water quantity and could potentially affect surface and groundwater quality in the San Juan Creek watershed.

The proposed high-pressure water conduit (penstock) system would be aligned through the east side of the Santa Ana (Elsinore) Mountains. Construction will occur through a combination of tunnel boring machine (TBM) technology and conventional hard-rock mining techniques. Groundwater inflows into tunnel excavation can adversely affect groundwater, including contributing to groundwater withdrawal or depletion, as well as create additional issues (dewatering) with regards to the discharge of waters generated by construction operations.

If the native groundwater pressures exceed the tunnel pressures, native groundwater could seep into the tunnels and lower the groundwater level if the water table lies above the tunnel. Conversely, if pressure is greater inside the tunnel, water may seep into the native groundwater table and possibly raise the surrounding groundwater elevation. Because portions of the tunnels would be concrete lined, it is not anticipated that operation of the tunnels would result in any water diversion or otherwise adversely affect groundwater.

Operation of the underground Powerhouse could have localized effects on groundwater flow patterns. Groundwater may need to be pumped out of the powerhouse cavity and could potentially be redirected to Lake Elsinore at the surface.

Impact H-11: Project operations could change water quality parameters.

Project operation (the cycling of water between the upper reservoir and Lake Elsinore, the fluctuating shoreline, and the maintenance of facilities and the primary transmission lines) could potentially affect multiple water quality parameters within Lake Elsinore (SARWQCB) and San Juan Creek (SDRWQCB). Changing water levels could potentially cause shoreline soils to expand and contract, asserting a stress that eventually causes the soil structure to break down to the point of failure and resulting in erosion and sedimentation. As Lake Elsinore is already a heavily turbid lake, this unanticipated effect would not cause an adverse effect (Anderson, 2007a) and no mitigation is required.

Project operation could affect the temperature, DO, and nutrient cycling occurring in Lake Elsinore. Water transferred and stored at the upper reservoir during nighttime hours, and passing through the turbine during the day, could raise or lower water temperatures beyond current observed trends in Lake Elsinore. The pumping of water and operation of the turbines could aerate the water above existing levels and benefit water quality, while discharges could disturb bottom sediments and increase turbidity and alter the nutrient cycling in the reservoir. Changing lake level elevations could also stir up sediments, increasing turbidity and affecting nutrient cycling. Depending on other factors at the time of release, a large nutrient release could stimulate additional algal growth in Lake Elsinore. Each of these issues have been addressed through technical studies undertaken by the SARWQCB (Anderson, 2006, 2007a, and 2007b).

Transferring water from Lake Elsinore at night and returning it during daylight hours would have minimal impacts on water temperature (Anderson, 2006). Anderson surmises that the friction associated with moving the water through the generating units could slightly raise the temperature of the water while storage at higher elevation and transfer timing (at night) could result in slight decreases to the temperature. Given that the conduits would be underground where temperatures would be much cooler than the summer time air temperatures at the lake, any gains in temperatures due to friction would likely be negated by the surrounding conditions. These impacts would be less than significant and no mitigation is required.

Although impacts may be localized in the area of the outlet, operation of the Project could increase the concentration of DO in waters returning to Lake Elsinore (even without the planned oxygenation enrichment described in Exhibit A). The activity of transferring the water through the conduit, penstock pipes, and turbines in conjunction with a greater surface area to volume ratio within the upper reservoir would allow for a greater amount of oxygen to become dissolved in the existing stream waters than under current conditions. Maintaining oxygenated water throughout the water column prevents the nutrients stored within the sediments from being released into the water column, which reduces the amount available for use by algae thus improving water quality. Over time, as additional nutrients settle they become stored in the sediments as long as oxygenated conditions persist. Beneficial impacts to water quality are expected to be incremental.

Project operations would involve the cycling of water between Lake Elsinore and the proposed Decker Canyon reservoir. Although impacts may be localized in the area of the outlet, there is an expected beneficial increase in DO as a result of this daily water cycling. It is expected that, over time, Project operations should provide a measurable benefit to the annual mean water quality by using temperature and oxygen concentration differences between the upper and lower reservoirs to promote mixing of the water column and control internal nutrient loading within Lake Elsinore; however, the Project alone is not expected to improve water quality to the point where water quality objectives could be met. This water quality effect would be incremental relative to the effects outlined in the Lake Elsinore and San Jacinto Watershed Authority's (LESJWA) "Lake Elsinore Stabilization and Enhancement Project," which includes the installation of a mechanical aeration system to improve water quality and the importation of recycled wastewater to Lake Elsinore to stabilize lake levels. According to the Joint Watershed Authority (2005), dry lake conditions would be eliminated entirely, whereas, under current conditions, lake levels will be below 1225-feet above msl (close to empty) 20 percent of the time.

Because lake level stabilization is necessary for the operation of the Project, a long-term water purchase agreement, or similar document, will be negotiated and executed with the EVMWD and/or other water providers in order to ensure the long-term availability of water in Lake Elsinore at elevations above 1240-feet above msl. Such an agreement (as a PME) will enhance water quality parameters in Lake Elsinore.

Impact H-12: Project operations could degrade water quality in San Juan Creek (Class II).

The storage of Lake Elsinore water in the upper reservoir within the San Juan Creek watershed could negatively affect water quality in the San Juan Creek drainage. Spills or releases of water stored in the proposed Decker Canyon reservoir or leaks in the reservoir liner or collection system, membrane system, water conveyance system, or subterranean diversion structure that would allow the water from the proposed Decker Canyon reservoir to reach the San Juan Creek drainage could potentially degrade the water quality in the San Juan Creek watershed.

Impact H-13: Project operations could result in dam breach and a consequent loss of human life.

Proposed development plans have been modified to reduce the height of the reservoir and better conform to the existing topography. As now proposed, the dike has been eliminated and the water elevation of the stored water lowered. The following analysis addresses the conceptual design presented in this application

Because the proposed upper reservoir site is located near the headwaters of San Juan Creek, roughly coincident with the drainage divide between that watershed and that of Lake Elsinore, a dam failure could discharge water into San Juan Creek, and a failure could discharge water toward Lake Elsinore. Mode of failure in the Applicant’s dam breach analyses were via a hypothetical piping failure; the hypothetical failure modes for the dike breach analyses included overtopping of the dike crest and internal erosion (piping) through the dike embankment materials.

FERC’s Division of Dam Safety and Inspection’s San Francisco Regional Office performed a Pre-License inspection and issued a report, dated January 6, 2005, during the Project No. 11858 proceeding. Paragraph A of the Pre-license Inspection Report discusses the downstream hazard potential of the project. The report notes that based on the dam break analyses included in the federal hydropower license application, a dam breach at the Decker Canyon Reservoir site would generate a flood wave that would cause overbank flow along San Juan Creek for about 15 miles to the Pacific Ocean. The areas subject to flooding include campgrounds, residential and commercial buildings, and Ortega Highway (State Route 74) stream crossings. The study estimates that depths could be as high as 39 feet in the narrow canyon areas. A similar study was performed to estimate inundation toward Lake Elsinore should an upper elevation dike fail. A dike breach could result in flooding, however, with less release of water. Structures and possibly residences in the City of Lake Elsinore would be inundated by up to six feet. The report notes that observations made during the inspection confirm that the Decker Canyon Reservoir would be classified as having a high downstream hazard potential. In accordance with the “Federal Guidelines for Dam Safety–Hazard Potential Classification Systems for Dams” (October 1998), dams assigned the high hazard potential are those for which failure or disoperation would probably cause loss of human life.

Inundation studies are conducted as a routine part of reservoir construction. The proposed reservoir’s design must conform to both FERC and California Department of Water Resources, Division of Safety of Dams’ (DSOD) dam safety requirements. In accordance therewith, substantial safety standards are required in order to minimize, to the maximum extent feasible, the potential for dam failure. Similarly, because electronic and visual monitoring of the reservoir will be required, evidence of potential safety considerations will be identified at the earliest possible time. If public safety conditions are identified, water in the upper reservoir can be released to Lake Elsinore and any remedial measures undertaken.

This impact could be potentially significant but would be reduced to a less-than-significant level through compliance with applicable federal and State design standards, including maintenance and monitoring requirements, and the implementation of the Applicant’s proposed protection, mitigation, and enhancement measures (PME-H-1b and PME H-12) located in Table E.2-11.

2.6.2 Potential Impacts of Primary Transmission Line

The California Department of Water Resources (DWR) subdivides the State into regions for planning purposes. California is divided into ten Hydrologic Regions (HR). Of those, the primary transmission line is located in the South Coast Region. Each HR is further subdivided into six smaller, nested levels comprising Hydrologic Units (HUs), Hydrologic Areas (HAs), Hydrologic Sub-Areas (HSAs), Super Planning Watersheds (SPWSs), and Planning Watersheds (PWS).

Table E.2-9, lists the different hydrologic units, areas, and hydrologic sub-areas which are traversed by the primary transmission line in Riverside County.

The primary transmission line span a number of watersheds, including portions of the 765-square mile San Jacinto River and 2,650-square mile Santa Ana River basins north and west of Lake Elsinore. Both watersheds are administered by the Regional Water Quality Control Board, Santa Ana Region (SARWQCB).

Table E.2-9: Hydrologic Units, Areas, and Subareas

Hydrologic Unit	Hydrologic Area	Hydrologic Subarea
Santa Ana (801.00)	Lake Mathews (801.33)	Lee Lake (801.24)
San Jacinto (802.00)	Elsinore Valley (802.31)	-
San Juan (901.00)	Mission Viejo (901.20)	Upper San Juan Creek (901.25)
	San Mateo Canyon (901.40)	-
	San Onofre (901.50)	San Onofre Valley (901.51)

Source: The Nevada Hydro Company, Inc.

The proposed primary transmission line is located in the Santa Ana Basin. The major river systems within this basin include the San Jacinto and the Santa Ana Rivers. The San Jacinto River watershed originates in the San Jacinto Mountains, drains westerly into Canyon Lake and terminates in Lake Elsinore. Urban areas within this watershed include Gilman Hot Springs, Hemet, Lake Elsinore, Menifee, Moreno Valley, Perris, San Jacinto, Sun City, and Winchester. The San Jacinto River system is also included within the Santa Ana River watershed. Under normal rainfall conditions, the San Jacinto River ends at Lake Elsinore and does not connect with the Santa Ana River. However, during years with high precipitation and runoff, the San Jacinto River flows through to the Santa Ana River.

Table E.2-10 summarizes the potential water resource impacts of the primary transmission line.

Table E.2-10: Primary Connection and Upgrades – Water Resource Impacts

Impact	Description
H-1	Construction activity could degrade water quality due to erosion and sedimentation.
H-2	Construction activity could degrade water quality through spills of potentially harmful materials.
H-3	Excavation could degrade groundwater quality in areas of shallow groundwater.
H-4	Creation of new impervious areas could cause increased runoff resulting in flooding or increased erosion downstream.
H-5	Transmission towers or other aboveground project features if located in a floodplain or watercourse could result in flooding, flood diversions, or erosion.

Source: The Nevada Hydro Company, Inc.

Impact H-1: Construction activity could degrade water quality due to erosion and sedimentation.

Disturbed soils are susceptible to erosive processes and may be transported into downstream waters, compromising water quality. Construction of the new transmission alignment may, therefore, affect the rates of erosion and sedimentation, resulting in degraded water quality. Because of the inherent nature of overhead transmission systems (lines suspended above the ground surface), the construction of the majority of the proposed primary transmission lines is anticipated to produce relatively little effect on erosion and sedimentation. Transmission towers would be sited to avoid floodplain areas and thus minimize the potential for affecting watercourses. Trenching or tunneling for the underground segment and construction of maintenance roads, however, are expected to increase the potential for erosion and sedimentation, potentially affecting water quality.

The primary transmission line will span only one major stream along the proposed approximately 8.5-mile transmission alignment which could be affected during construction.

Impact H-2: Construction activity could degrade water quality through spills of potentially harmful materials.

Construction of the proposed primary transmission line would require the use of a variety of motorized heavy equipment including, but not limited to, 4x4 pickups, fuel trucks, cranes, dozers, forklifts, concrete trucks, backhoes, air compressors, graders, conductor pullers, shield tensioners, and drill rigs. Much of this equipment would require job-site replenishment of petroleum products and other hazardous materials, including oils, grease, coolants, lubricants, and other fluids. The accidental spill of these products, or similar construction-related materials, could lead to the discharge of contaminants onto the soil or into existing surface waters crossed by the proposed transmission line or at the site of the substations and switchyard.

Conveyance of contaminants could take place directly at the time of the spill or could be retained in place (such as soil contaminants) until a runoff event delivered them to a watercourse later or could infiltrate into the soil and/or groundwater below. A chemical spill affecting a water body, stream channel, wetland area, or groundwater is a potentially significant impact but would be mitigable to a level-that-significant level with the implementation of PMEs H-2a, H-2b, and H-2c, in combination with PME H-7.

In addition, the development, implementation, and enforcement of the hazardous substances spill prevention and control plan and hazardous substances response plan (PME H-7) would help to minimize the amount of hazardous materials and petroleum products that would enter surface and/or groundwater in the event of a spill.

Impact H-3: Excavation could degrade groundwater quality in areas of shallow groundwater.

Construction of the proposed transmission facilities, including the placement of any overhead towers and the construction of the new substation has only minimal potential to affect groundwater. However, construction of underground segments of the transmission line and construction of temporary and permanent access and spur roads could intercept, daylight, and/or destabilize shallow groundwater resources and may exist in the area of those construction activities.

The main effect of excavation and interception of groundwater and the daylighting of a slope is the draining of the groundwater that had been held in place by the removed soil. In topographic draws and creek valleys, such interception of groundwater can substantially dry up the area down slope, thus cutting off the supply of shallow groundwater and creating new surface drainage and/or flooding conditions. Upslope and downslope areas can realize a decline in groundwater levels. In arid environments, such effects could be profound for vegetation and the species that depend upon existing hydrologic conditionsThis impact is potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs H-3a and H-3b.

Impact H-4: Creation of new impervious areas could cause increased runoff resulting in flooding or increased erosion downstream.

Construction of the primary transmission line could result in an increase in runoff due to construction vehicles compacting pervious area, and the introduction of impervious surfaces along the underground transmission line and at the new substation.

Similarly, the construction of the new substation will result in a decrease in permeable surface areas as a portion of the site is replaced with concrete pads, asphalt paving, buildings, and other impervious surfaces. Although the extent of that coverage remains subject to final design plans, any change in the volume of surface water discharged from each site would not be expected to be significant based on the limited extent of each change in the context of the size of each affected watershed. PME H-4 will ensure that site-specific drainage can be safely conveyed from the proposed substation.

2.6.3 Potential Impacts of the Project

Cumulative impacts to water resources from the Project primary transmission line and generation would be similar to those presented in those two preceding sections.

Table E.2-11:PME's – Hydrology and Water Quality Impacts

Measure	Description
H-1a	Identify and mark sensitive areas for avoidance. Specific sites as identified by authorized agencies (e.g., fragile watersheds) where construction equipment and vehicles are not allowed shall be clearly marked on-site before construction or surface disturbing activities begins. Construction personnel shall be trained to recognize these markers and understand applicable equipment movement restrictions.
H-1b	Develop and implement construction Best Management Practices. (1) A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and implemented. (2) Storm Water Best Management Practices (BMPs) for construction shall be implemented per the requirements of the project's SWPPP. (3) Silt fencing, straw mulch, straw bale check dams shall be installed, as appropriate to contain sediment within construction work areas and staging areas. Where soils and slopes exhibit high erosion potential, erosion control blankets, matting, and other fabrics and/or other erosion control measures shall be installed, as appropriate to contain sediment within construction work areas and staging areas. (4) The potential for increased sediment loading shall be minimized by limiting road improvements to those necessary for project construction, operation, and maintenance. (5) Upland pull sites shall be selected to minimize, to the extent feasible, impacts to surface waters, riparian areas, wetlands, and floodplains.
H-1c	Stream crossings at low-flow periods. Stream crossing shall be constructed at low-flow periods and, if necessary, a site-specific mitigation and restoration plan shall be developed.
H-1d	Compliance with NPDES regulations. The Applicant shall: (1) secure any required General Permit for Storm Water Discharges Associated with Construction Activities (NPDES permit) authorization from the RWQCB and/or SWRCB as required to conduct construction-related activities; and (2) establish and implement a SWPPP during construction to minimize hydrologic impacts.
H-1e	Construction routes to avoid and minimize disturbance to stream channels. To the extent feasible, where the construction of access roads would disturb sensitive features such as streambeds, the route of the access road shall be adjusted to avoid or minimize such impacts. Whenever practical, construction and maintenance traffic shall use existing roads or cross-county access routes (including the ROW) which avoid impacts to sensitive features. To minimize ground disturbance, construction traffic routes will be clearly marked with temporary markers, such as easily visible flagging. Construction routes, or other means of avoidance, must be approved by the appropriate agency or landowner before use. Where it is not feasible for access roads to avoid streambed crossings, such crossings shall be built at right angles to the streambeds, whenever feasible. Where such crossings cannot be made at right angles, where feasible, the Applicant shall limit roads constructed parallel to streambeds to a maximum length of 500 feet at any one transmission crossing location. Such parallel roads would be constructed in such a manner that minimizes potential adverse impacts on waters of the U.S. or waters of the State. Streambed crossings or roads constructed parallel to streambeds shall require review and approval of necessary permits from the USCOE, CDFG, RWQCB, and SWRCB.
H-1f	Construction on USDA Forest Service land to be subject to an approved, site-specific SWPPP and Sediment Control Plan. A site-specific sediment control plan and SWPPP shall be prepared for construction within the National Forest. These plans shall identify and characterize potentially affected water resources and provide post-construction remediation and monitoring details. The sediment control plan shall include construction in the dry periods (but not preclude

Measure	Description
	construction in the wet periods), as well as construction by helicopter in areas where terrain is steep and the potential consequences of sedimentation severe. These plans shall be submitted to the USDA Forest Service (on NFS lands) for review and approval prior to the commencement of construction.
H-2a	Groundwater testing and treatment before disposal. (1) In no case shall groundwater removed during construction be discharged to surface waters or storm drains without first obtaining any required discharge permits. (2) If dewatering is necessary, the water will be contained and sampled to determine if contaminants requiring special disposal procedures are present. (3) If the water tests sufficiently clean and land application is determined feasible per applicable SWRCB and RWQCB requirements, the water may be directed to relatively flat upland areas for evaporation and infiltration back to the water table, used for dust control, or used as makeup for a construction process (e.g., concrete production). (4) Water determined to be unsuitable for land application or construction use shall be disposed of in another manner, such as treatment and discharge to a sanitary sewer system in accordance with applicable permit requirements or hauled off the site to an appropriate disposal facility.
H-2b	No storage of fuels and hazardous materials near sensitive water resources. Storage of fuels and hazardous materials will be prohibited within 200 feet of groundwater supply wells and within 400 feet of community or municipal wells.
H-2c	Proper disposal and clean-up of hazardous materials. Hazardous materials will not be disposed of onto the ground, the underlying groundwater, or any surface water. Totally enclosed containment will be provided for trash. Petroleum products and other potentially hazardous materials shall be removed to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials. In the event of a release of hazardous materials to the ground, it will be promptly cleaned up in accordance with applicable regulations.
H-3a	Minimize impacts from road construction. To the extent possible, BMPs and sound road design practices cognizant of road construction effects shall be carried out to minimize the inherent effects of road construction on groundwater. In certain situations, there is no cost-effective alternative or mitigation for the adverse effects of hillslope road cuts on local groundwater. Unless authorized by the USDA Forest Service(on NFS lands), transmission towers shall be installed via helicopter in areas with slopes greater than 15 percent to minimize the potential effects of road cuts on groundwater.
H-3b	Compensate affected water supply. Should destabilization of artesian groundwater serving as water supply occur, the Applicant shall compensate delivery of additional water supply where a direct linkage between the Applicant’s actions and a diminution of water supplies can be firmly affixed.
H-3c	Isolate underground powerhouse from groundwater flows. The Applicant shall use a combination of sealing and water control sumps to isolate the powerhouse from underground flows. The Applicant shall ensure that groundwater flow patterns at the proposed powerhouse site and penstock alignment are not adversely affected.
H-4	Install substation runoff control. The pad for new substations shall be constructed with a pervious and/or high-roughness surface where possible to ensure maximum percolation of rainfall after construction. If required, detention/retention basins shall be installed to reduce local increases in runoff, particularly on frequent runoff events. Downstream drainage discharge points shall be provided with erosion protection and designed such that flow hydraulics exiting the site mimics the natural condition as much as possible. A drainage design hydrologic and hydraulic analysis shall be provided at least 60 days prior to the initiation of construction.
H-6	Scour protection to include avoidance of bank erosion and effects adjacent property. A determination of towers requiring scour protection shall be made during the design phase by a

Measure	Description
	registered professional engineer with expertise in river mechanics. All towers within the project RPW shall be reviewed by the river mechanics engineer and the foundations of those towers determined to be subject to scour or lateral movement of a stream channel shall be protected by burial beneath the 100-year scour depth, setback from the channel bank, or bank protection provided as determined by the river mechanics engineer. An evaluation shall also be made regarding the potential for the tower and associated structures to induce erosion onto adjacent property. Should the potential for such erosion occur, the tower location shall be moved to avoid this erosion or erosion protection (such as rip rap) provided for affected properties.
H-7	Develop Hazardous Substances Response Plan for project operation. The Applicant shall prepare and implement a Hazardous Substance Control and Emergency Response Plan for project operation and a copy shall be kept on the site at substations. This plan shall include definition of an emergency response program to ensure quick and safe cleanup of accidental spills, including prescriptions for hazardous-material handling to reduce the potential for a spill during construction. The plan will identify areas where refueling and vehicle-maintenance activities and storage of hazardous materials, if any, will be permitted.
H 12	Develop and implement a water spill, release, and/or leak prevention plan. Unless otherwise addressed in any permit issued by the Federal Energy Regulatory Commission (FERC), the USDA Forest Service, and/or the California Division of Safety of Dams, at least 60 days prior to the commencement of construction of the upper reservoir, the Applicant shall file with the SWRCB a plan for protection of the San Juan Creek Watershed from any water spill, release, and/or leak. At a minimum, the plan shall require the Applicant to (1) maintain the project area appropriately sealed off from the San Juan Creek Watershed during construction and operation of the project; (2) to periodically test the upper reservoir for any leaks, releases, and/or spills; (3) to inform the SWRCB immediately of the nature, time, date, location, and action taken for any spill affecting the San Juan Creek Watershed; and (4) establish a protocol, to be approved by the SWRCB, for cleanup and monitoring any spill, release, and or leak.

BLUEWATER
RENEWABLE ENERGY STORAGE

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E
ENVIRONMENTAL REPORT
SECTION 2 – HYDROLOGY AND WATER QUALITY

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

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Federal Energy Regulatory Commission
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EXHIBIT E– SECTION 2 REPORT ON WATER USE AND QUALITY

As required under 18 CFR 4.41(f)(2), the Applicant must discuss water quality and flows and contain baseline data sufficient to determine the normal and seasonal variability, the impacts expected during construction and operation, and any mitigative, enhancement, and protective measures proposed by the applicant. The report must be prepared in consultation with the State and Federal agencies with responsibility for management of water quality and quantity in the affected stream or other body of water. The report must include:

(i) A description of existing instream flow uses of streams in the project area that would be affected by construction and operation; estimated quantities of water discharged from the proposed project for power production; and any existing and proposed uses of project waters for irrigation, domestic water supply, industrial and other purposes;

(ii) A description of the seasonal variation of existing water quality for any stream, lake, or reservoir that would be affected by the proposed project, including (as appropriate) measurements of: significant ions, chlorophyll a, nutrients, specific conductance, pH, total dissolved solids, total alkalinity, total hardness, dissolved oxygen, bacteria, temperature, suspended sediments, turbidity and vertical illumination;

(iii) A description of any existing lake or reservoir and any of the proposed project reservoirs including surface area, volume, maximum depth, mean depth, flushing rate, shoreline length, substrate classification, and gradient for streams directly affected by the proposed project;

(iv) A quantification of the anticipated impacts of the proposed construction and operation of project facilities on water quality and downstream flows, such as temperature, turbidity and nutrients;

(v) A description of measures recommended by Federal and State agencies and the applicant for the purpose of protecting or improving water quality and stream flows during project construction and operation; an explanation of why the applicant has rejected any measures recommended by an agency; and a description of the applicant's alternative measures to protect or improve water quality stream flow;

(vi) A description of groundwater in the vicinity of the proposed project, including water table and artesian conditions, the hydraulic gradient, the degree to which groundwater and surface water are hydraulically connected, aquifers and their use as water supply, and the location of springs, wells, artesian flows and disappearing streams; a description of anticipated impacts on groundwater and measures proposed by the applicant and others for the mitigation of impacts on groundwater.

2.0 HYDROLOGY AND WATER QUALITY

In response to issues raised by resource agencies and others, the Applicant contacted Professor Michael Anderson of the University of California, Riverside and requested that he review and provide comments on this section of the Application.[1] Dr. Anderson noted that numerous studies have been conducted since the original total maximum daily load (TMDL) for Lake Elsinore was developed over 20 years ago (as described herein) as part of compliance and other efforts, and that a revision to the TMDL is presently underway by third parties. A Memorandum was recently [1]developed between the Lake Elsinore and Canyon Lake TMDL Task Force and Executive Officer of the Santa Ana Regional Water Quality Control Board outlining incremental TMDL revisions.

Dr. Anderson further advised that what has been brought into sharper focus recently is the tremendous range of lake level, salinity and impacts of droughts. As an example, please see his technical memo (Surface Elevation and Salinity in Lake Elsinore: 1916-2014) contained in Volume 11 of 2017 FLA Application which should be viewed as just an example of work addressing longer-term variability in lake level and salinity. New insights have also been gained about the presence of toxin-forming algae in Lake Elsinore and concentrations of algal toxins that can approach advisory levels.

Dr. Anderson was not aware of new information about the upper watershed, San Juan and San Mateo Creeks, groundwater, etc. although deferred to others who may be more familiar with recent studies there.

However, and in general, he does not expect the potential impacts of the operation of the Project generation facilities to be substantially different based upon work conducted since the original application to FERC was developed.

Finally, Dr. Anderson noted, as the Applicant is well aware, that the water budget/availability issue is arguably the most acute issue facing the Lake. Droughts can be more extensive than had been really appreciated, conservation has altered water use patterns, and recycled water is increasingly highly valued, so identifying a reliable source of water for Lake Elsinore during periods of drought and maintenance of stable operating conditions are critical for the success of the project.

As a result of Dr. Anderson's comments, the Applicant intends to:

1. Focus on developing and securing supplemental water to maintain lake levels and help assure water quality and recreation benefits for Lake Elsinore, and
2. Work closely with stakeholders and Regional Board to help improve water quality in the lake and help it achieve compliance with TMDL goals

2.1 Introduction to the Topic

The Project area contains several distinct regional physiographic features, including the eastern slopes of the Santa Ana and Elsinore Mountains, the Perris Uplands, and the Elsinore-Temecula Trough. The Project area consists of gently rolling hills at the lower elevations and steeper slopes at upper elevations, ranging

[1]/ Dr. Anderson is a Professor Emeritus specializing in applied limnology and lake/reservoir management, surface water quality and modeling, fate of contaminants in soils, sediments and waters and environmental chemistry. He is a noted authority on Lake Elsinore.

[1] Key Principles for Potential Revision of the TMDL Technical Report: Revision to the Lake Elsinore and Canyon Lake Nutrient TMDLs (December 1, 2018) Memorandum Between the Lake Elsinore and Canyon Lake TMDL Task Force Members and Executive Officer for the Santa Ana Regional Water Quality Control Board August 2022

in elevation from 1200 to 3400-feet above msl. The proposed alignment of the primary transmission line is at the foot of northeast-facing slopes of the Santa Ana Mountains. The proposed Santa Rosa Substation, Powerhouse, and most of the primary transmission line occurs within the Elsinore-Temecula Trough, which runs along the northeast toe of the Santa Ana Mountains.

Climate in the Lake Elsinore area is semi-arid, with warm, dry summers and mild winters. Summer temperatures can exceed 100 degrees Fahrenheit but nights are generally cool. Annual precipitation averages 8-12 inches and annual evapotranspiration (ET) averages about 55 inches. A summary of monthly temperature and precipitation for the Lake Elsinore area, based on data spanning 57 years (1948-2005), is shown in Table E.2-1.

Table E.2-1: City of Lake Elsinore Climate Summary

Temperatures and Precipitation						
Month	Temperature (°F)			Precipitation (inches)		
	Mean	Avg Max	Avg Min	Avg	Max	Min
January	51.0	65.3	36.8	2.68	13.94	0.00
February	53.4	67.7	39.0	2.46	11.94	0.00
March	56.3	71/1	41.5	1.79	0.83	0.00
April	60.7	76.4	44.8	0.67	4.27	0.00
May	66.2	82.0	50.3	0.18	2.02	0.00
June	72.7	90.5	54.7	0.02	0.32	0.00
July	78.9	98.0	59.7	0.07	1.67	0.00
August	79.5	98.4	60.7	0.10	3.13	0.00
September	75.2	93.6	56.9	0.24	4.26	0.00
October	66.8	83.9	49.7	0.42	7.66	0.00
November	57.3	73.1	41.6	1.07	7.33	0.00
December	51.4	66.3	36.4	1.65	8.67	0.00
Annual	64.1	80.5	47.7	11.35	23.02	2.71

Source: National Weather Service Cooperative Station 42805 – Elsinore, 1948-2005

2.2 Hydrology and Water Quality Regulatory Setting

The following general discussion is presented of certain Federal, State, and local statutes and regulations that may be most applicable to an understanding of the Project's regulatory setting.

- Federal Clean Water Act. The Federal Water Pollution Control Act of 1972 (33 U.S.C. 1251 et seq.), known as the Federal; Clean Water Act (CWA), established a national policy designed to "restore and maintain the chemical, physical and biological integrity of the Nation's waters." The CWA requires states to develop water quality standards consisting of a detailed description of the hydrologic descriptions of the waterbodies, the beneficial uses which apply to each waterbody, and the water quality criteria (objectives) which will protect those uses. As specified, "[e]ach state must specify appropriate water uses to be achieved and protected. The classification of the waters of the state must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish, and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation (40 CFR 131.11[a]).

The CWA requires states to adopt (and the USEPA to approve) water quality standards for water bodies.[2] Water quality standards consist of designated beneficial uses for a particular water body, along with water quality criteria necessary to support those uses. Water quality criteria are prescribed concentrations or levels of constituents or narrative statements that represent the quality of water that supports a particular use. Because California has not established a complete list of acceptable water quality criteria, the USEPA established numeric water quality criteria for certain toxic constituents in the form of the California Toxics Rule (CTR) (40 CFR 131.38). Water bodies not meeting water quality standards are deemed "impaired" and, under Section 303(d) of the CWA, are placed on a list of impaired waters for which a TMDL must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, non-point, and natural sources that a water body may receive without exceeding applicable water quality standards (with a "factor of safety" included). Once established, the TMDL is allocated among current and future pollutant sources to the water body. TMDL is a number that represents the assimilative capacity of water for a particular pollutant or the amount of a particular pollutant that water can receive without impact to its beneficial uses.

The CWA effectively prohibits discharges of storm water from most construction sites unless the discharge is in compliance with a NPDES permit. The SWRCB is the permitting authority in California and has adopted a "General Permit for Stormwater Discharges Associated with Construction Activities" (General Permit)[3] governing storm water and authorized non-storm water flows from all construction sites one acre and larger throughout California. The General Permit requires construction-site operators to develop and implement a storm water pollution prevention plan (SWPPP) and an associated monitoring program and, for projects discharging directly into waters impaired due to sedimentation or involving potential discharge of non-visible contaminants that may exceed water quality objectives, a storm water sampling and analysis strategy (SWSAS) to meet CWA technology standards and to prevent construction sites from contributing to excursions of water quality standards.

- National Flood Insurance Reform Act. The Federal Emergency Management Agency (FEMA), a part of the Department of Homeland Security, prepares flood insurance rate maps (FIRM) in order to identify those areas that are located within the 100-year floodplain boundary,[4] termed "Special Flood Hazard Areas" (SFHAs). A 100-year flood does not refer to a flood that occurs once every 100 years but refers to a flood level with a one percent chance of being equaled or exceeded in any given year.[5] The SFHAs are subdivided into insurance risk rate zones. Areas between the 100 and 500-year flood boundaries are termed "moderate flood hazard areas." Areas located outside the 500-year flood boundary, are termed "minimal flood hazard areas."

[2]/ In California, the USEPA has delegated responsibility for implementation of portions of the CWA to the State Water Resources Control Board (SWRCB) and its nine regional water quality control boards. The Regional Water Quality Control Board, Santa Ana Region (SARWCB) and the California Regional Water Quality Control Board, San Diego Region (SDRWQCB) are the local boards with jurisdiction over the Project sites.

[3]/ State Water Resources Control Board, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity, SWRCB Order No. 99-08-DWQ, NPDES No. CAS000002.

[4]/ As defined in the Standard Flood Insurance Policy (SFIP), "flood" is defined as "[a] general and temporary condition of partial or complete inundation of normally dry land areas from overflow of inland or tidal waters or from the unusual and rapid accumulation or runoff of surface waters from any source."

[5]/ Modern hydrologists define floods in terms of probability, as expressed in percentage rather than in terms of return period (recurrence interval). Return period (the N-year flood) and probability (p) are reciprocals, that is, p = 1/N. A flood having a 50-year return frequency (Q50) is commonly expressed as a flood with the probability of recurrence of 0.02 (2 percent chance of being exceeded) in any given year.

- Executive Order 11988 – Floodplain Management. Executive Order (EO) 11988 directs all Federal agencies to seek to avoid, to the extent practicable and feasible, all short- and long-term adverse impacts associated with floodplain modifications and to avoid direct and indirect support of development within 100-year floodplains whenever there is a reasonable alternative available.

- Cobey-Alquist Flood Plain Management Act. The Cobey-Alquist Flood Plain Management Act, codified in Sections 8400-8415 of the CWC, states that a large portion of land resources of the State are subject to recurrent flooding. The public interest necessitates sound development of land use, as land is a limited, valuable, and irreplaceable resource, and the floodplains of the State are a land resource to be developed in a manner that, in conjunction with economically justified structural measures for flood control, will result in prevention of loss of life and of economic loss caused by excessive flooding.

  The primary responsibility for planning, adoption, and enforcement of land-use regulations to accomplish floodplain management rests with local levels of government. It is the State's policy to encourage local government to plan land-use regulations to accomplish floodplain management and to provide State assistance and guidance.

- •California Water Code. The Porter-Cologne Water Quality Control Act (Division 1, Chapter 2, Article 3, Section 13000 et seq., CWC) (Porter-Cologne) constitutes a comprehensive plan for protecting the quality and maximizing the beneficial use of the State's waters.

  As specified therein, the State "Legislature finds and declares that. . . the quality of all the waters of the State shall be protected for use and enjoyment by the people of the state... activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable."[6] Under Porter-Cologne, the State's RWQCBs were required to: (1) formulate and adopt water quality control plans for all areas within the region;[7] (2) establish water quality objectives that "will ensure the reasonable protection of beneficial uses"[8] of State's waters; and (3) prescribe waste discharge requirements governing discharges to land and waters within the regions. Porter-Cologne establishes the principal California program for water quality control. Under Porter-Cologne, the SWRCB is mandated to implement the provisions of the CWA, which delegation is authorized by that Federal act.

  To implement and enforce the provisions of Porter-Cologne and the CWA, Porter-Cologne divides the State into nine regional boards that, under the guidance and review of the SWRCB, implement and enforce the provisions of both the State and Federal statutes. The Project is located within Region 8 (Santa Ana) and Region 9 (San Diego) and falls under the jurisdiction of the SARWQCB and SDRWQCB.

  As further indicated in the CWC, Section 100 declares that it is policy of the State that "the water resources of the state be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such water is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare." Under Section 13000, the Legislature declared that the people of the State have a primary interest in the conservation, control, and utilization of the water resources, and that the "quality of all the waters of the State shall be protected for use and enjoyment by the people of the state. The Legislature further finds and declares that activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be

[6]/ Section 13000, California Water Code.

[7]/ Section 13240, California Water Code.

[8]/ Section 13241, California Water Code.

made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible."

As specified in Section 13751, every person who digs, bores, or drills a water well, cathodic protection well, ground water monitoring well, or geothermal heat exchange well, abandons or destroys such a well, or deepens or reperforates such a well shall file with the California Department of Water Resources (Department) a report of completion within sixty days from the date that construction, alteration, abandonment, or destruction is complete. Section 13800.5(a)(1) further specifies that the Department shall develop recommended standards for construction, maintenance, abandonment, or destruction. Those standards are contained in the Department's "California Well Standards, Bulletin 74-90 (Supplement to Bulletin 74-81)."

- California Code of Regulations. The California Department of Health Services (DHS) is responsible for establishing uniform Statewide reclamation criteria to ensure that the use of recycled water is not detrimental to public health and protects beneficial uses. The existing DHS criteria include treatment requirements for recycled water used to create or augment recreational impoundments. In Title 22, Division 4, Chapter 3 (Water Recycling Criteria), the DHS sets forth water quality criteria, treatment process requirements, and treatment reliability criteria for reclamation operations. Section 60305 specifies that recycled water used as a source supply for non-restricted recreational impoundment shall be disinfected tertiary recycled water subjected to conventional treatment. Disinfected tertiary recycled water that has not received conventional treatment may be used for non-restricted recreational impoundment provided that the recycled water is monitored for the presence of pathogenic organisms in accordance with certain conditions. The degree of treatment specified represents an approximately 5-log reduction in the virus content of the water. The DHS has determined that this degree of virus removal is necessary to protect the health of people using the impoundments for water contact recreation. The DHS has developed wastewater disinfection guidelines[9] for discharges of wastewater to surface waters where water contact recreation (REC1) is a beneficial use. The guidelines recommend the same treatment requirements for wastewater discharges to REC1 waters as those stipulated in Title 22 for supply of recycled water to non-restricted recreational impoundments.

  Pursuant to Section 8589.5 of the CGC, inundation maps showing the areas of potential flooding in the event of sudden or total failure of any dam, the partial or total failure of which the Office of Emergency Services (OES) determines, after consultation with the California Department of Water Resources, would result in death or personal injury, shall be prepared and submitted to the OES. Sections 2575-2578.3 in Title 19 (Dam Inundation Mapping Procedures) establish State regulations in compliance therewith.

- California Fish and Game Code. The CF&GC contain several provisions that regulate nonpoint source discharges. As specified under Section 5650 of the CFGC, except as authorized by a State or Federal permit, "it is unlawful to deposit in, permit to pass into, or place where it can pass into the waters of this State" any "petroleum or residuary product of petroleum, or carbonaceous material or substance," any "sawdust, shavings, slabs, edgings," and any "substance or material deleterious to fish, plant life, or bird life."

- California Antidegradation Policy. California's Antidegradation Policy, formally known as the Statement of Policy with Respect to Maintaining High Quality Waters in California (SWRCB Resolution No. 68-16), restricts degradation of surface and ground waters. In particular, this policy protects waterbodies where existing quality is higher than necessary for the protection of beneficial uses.

[9]/ California Department of Health Services, Wastewater Disinfection for Health Protection, 1987.

Under the Antidegradation Policy, any actions that can adversely affect water quality in all surface and groundwaters must: (1) be consistent with maximum benefit to the people of the State; (2) not unreasonably affect present and anticipated beneficial use of the water; and (3) not result in water quality less than that prescribed in water quality plans and policies. Any actions that can adversely affect surface waters are also subject to the Federal Antidegradation Policy (40 CFR 131.12) developed under the CWA.

2.3 Surface Water

The proposed alignment of the primary transmission line crosses over an estimated 6 USGS-depicted blue-line (jurisdictional) drainages. Most of these drainages are considered ephemeral. The route of the primary line crosses the Temescal Wash south of the I-15 Freeway along Temescal Canyon Road near Alberhill. This watercourse contains consistent flowing water during the winter and spring seasons.

With respect to surface water hydrology, the environmental setting is further described below.

2.3.1 Lake Elsinore

Lake Elsinore is a natural lake and is about 5 miles long and 2 miles wide. The primary source of water to the lake is the San Jacinto River with a drainage area of about 723 square miles, which is the largest part of the 782 square mile drainage area to Lake Elsinore. The remaining watershed consists of smaller tributaries which flow directly into Lake Elsinore and direct rainfall on the lake surface. Canyon Lake (Railroad Canyon Reservoir), which has a storage capacity of about 12,000 acre-feet (AF) and a surface area of 525 acres is located along the San Jacinto River, about 3 miles upstream from Lake Elsinore. The Elsinore Valley Municipal Water District (EVMWD) operates the reservoir for water supply and storage of water purchased from the Colorado River. Spill from the Canyon Lake Dam into Temescal Creek is relatively rare due to the EVMWD's withdrawals and small inflow values. Spill events typically occur only during high runoff from winter storm events in extremely wet years.

Table E.2-2 provides flow data for USGS Gage No. 11070500 located about 2 miles downstream from the Canyon Lake Dam. Natural inflow to Lake Elsinore average 14,788 acre-feet per year (AFY).

Table E.2-2: Daily Discharge Statistics for San Jacinto River at Elsinore, California USGS Gage No. 11070500 (Water Years 1975 to 2016) (cfs)

Month	Mean	Maximum	Minimum	P10	P90
Annual	20.4	-	8,080.00		
January	43.71	0.15	4,490.00	0.56	36.74
February	101.10	0.17	8,080.00	0.68	146.95
March	68.35	-	5,350.00	0.72	191.68
April	13.40	0.01	365.00	0.40	57.87
May	6.13	-	490.00	0.16	14.72
June	0.83	-	17.00	0.00	2.37
July	0.31	-	3.37	-	1.02
August	0.23	-	3.62	-	0.65
September	0.25	-	3.13	-	0.70
October	2.17	-	1,010.00	0.03	1.02
November	1.18	-	305.00	0.17	1.43

December	7.07	-	3,040.00	0.46	2.88

Source: United States Geological Survey

Historically, the lake elevation was highly variable and has completely dried out including years 1850, 1880, 1954, and 1959 through 1963. As shown in Figure E.2-1, Lake Elsinore was very low or completely dry throughout most of the 1950's and 1960's. Conversely, Lake Elsinore spills into Temescal Creek only during extremely wet years (1919, 1981, 1983, 1993, and 1995) and has caused extensive flooding in the City during such periods.

Adjacent and located to the southeast of Lake Elsinore are three other water bodies: Back Basin, Lake Alpha, and Lake Beta. Back Basin is normally dry and is separated from Lake Elsinore by a 2.5-mile-long earthen berm constructed as part of the Lake Elsinore Management Project under the auspices of the U.S. Army Corps of Engineers (Corps), U.S. Bureau of Land Management (BLM), and Riverside County Flood Control District. This project was completed in the early 1990s to reduce evaporation losses from Lake Elsinore and provide additional flood storage, while improving water quality, habitat, and recreational opportunities associated with Lake Elsinore. The Back Basin berm has an overflow weir at elevation 1,262 feet msl at which point flow from Lake Elsinore enters Back Basin. Lake Alpha and Lake Beta are connected to Lake Elsinore by a 48-inch gated conduit in the levee. These two lakes form a wetland area and are effectively the low spots in the Back Basin.

An unfinished element of the Lake Elsinore Management Project is the establishment of a long-term supplemental water supply for the lake. Planners have determined that recycled water would be a preferred source over using scarce potable water for lake level stabilization.

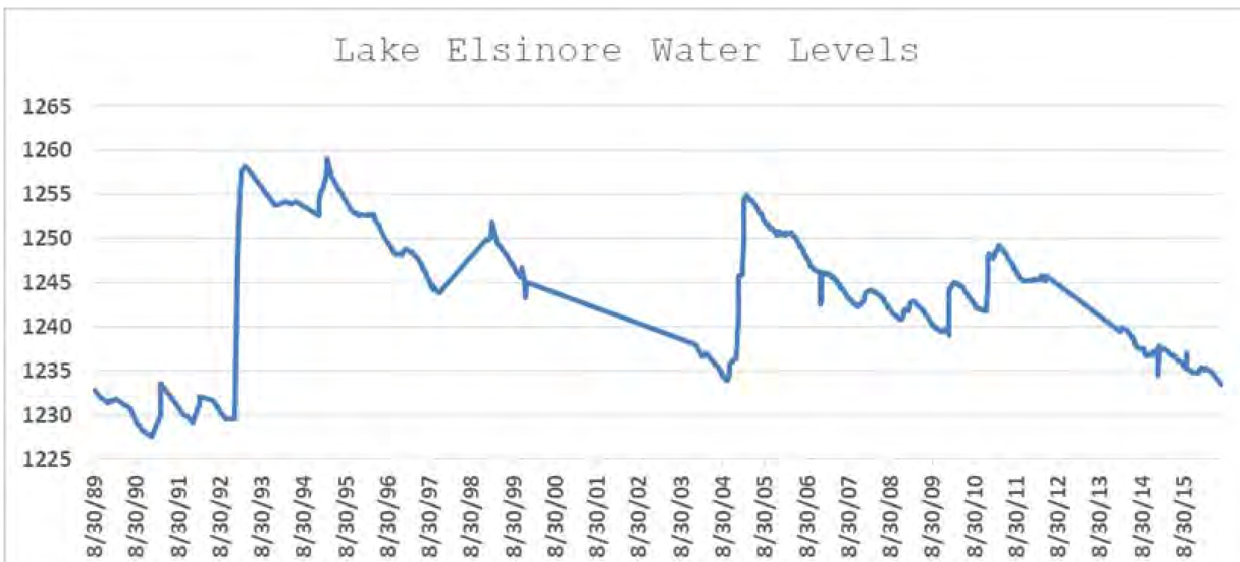

Figure E.2-1: Lake Elsinore Elevations
Source: Santa Ana Watershed Project Authority

To address this issue, the EVMWD and the City of Lake Elsinore formed a Recycled Water Task Force charged with determining public opinion on the use of recycled water to supplement Lake Elsinore that identified the desired actions and outcomes for the use of recycled water, and prepared a white paper on the topic. The task force published its findings in 1997 and concluded that recycled water may be acceptable for supplementing the water in Lake Elsinore provided that standards for disinfected tertiary treatment approved uses are met, nutrient removal to within the lowest natural background levels can be integrated into the next treatment plant upgrade, and a lake water quality monitoring program is implemented. Subsequently, the EVMWD implemented a feasibility study toward applying for a National

Pollution Discharge Elimination System (NPDES) permit and, along with the Eastern Municipal Water District (EMWD), began a pilot discharge project in June 2002. With discharge permits to add 4,480 AF of recycled water and up to 5,000 AF of groundwater (from the Island Wells) each year for two years, the pilot discharge project was intended to increase and stabilize lake levels and to test the effects of recycled water discharge on water quality and beneficial uses of the lake.

In July 2001, the Joint Watershed Authority filed a Notice of Intent to prepare a Programmatic Environmental Impact Report for the Lake Elsinore Stabilization and Enhancement Project. The stated objectives of this project are the following: (1) stabilization of water level of Lake Elsinore, by maintaining the lake elevation within a desirable operating range (minimum of 1240-feet to a maximum of 1247-feet above msl); (2) improvement of lake water quality (i.e., reduce algae blooms, increase water clarity, increase DO concentrations throughout the water column, and reduce or eliminate fish kills); and (3) enhancement of Lake Elsinore as a regional aesthetic and recreational resource. The Joint Watershed Authority approved the Lake Elsinore Stabilization and Enhancement Project in September 2005.

The primary source for make-up water is EVMWD's Regional Reclamation Plant[10] adjacent to Lake Elsinore. EVMWD relies on Water Rights Permit No. 30520 for an exclusive right to all water discharged from the reclamation plant. EVMWD also can supplement make-up water with water from its Island Wells. EVMWD and the Nevada Hydro Company (2005) determined that no water acquisition rights would be needed to purchase reclaimed water.

Substantial human actions in the watershed and Lake Elsinore itself affect the lake's inflow, elevation, and discharge. Water can flow out of Lake Elsinore through an outlet channel and into Warm Springs Creek and subsequently to Temescal Wash whenever the lake level exceeds 1255-feet above msl. This only occurs under torrential rainfall conditions or when an extended wet period results in abnormally high lake elevations. The bottom elevation of Lake Elsinore is 1,223 feet msl. At an elevation of 1240-feet above msl, Elsinore Lake has a surface area of 3,074 acres and stores 38,519 AF.

Historically, the lake elevation was highly variable and has completely dried out in certain years, including years 1850, 1880, 1954, and 1959 through 1963 (Dunbar, 1990, as cited in Joint Watershed Authority, 2005). Evaporation losses from Lake Elsinore are substantial, estimated at 56.2 inches per year, and are much larger than the average annual precipitation of 11.6 inches, which contributes to very unstable lake levels. Such evaporation losses translate to 15,500 AF per year, assuming a nominal elevation of 1245-feet above msl, which is an elevation that corresponds to a lake area of 3,319 acres.

Below Lake Elsinore, Temescal Wash flows about 28 miles in a northwesterly direction to its confluence with the Santa Ana River, just upstream of Prado dam (Joint Watershed Authority, 2005). Following the construction of the Back Basin berm and other improvements as part of the Lake Elsinore Management Project, Lake Elsinore has a 100-year flood elevation of 1263.3-feet above msl and a combined storage of about 150,000 AF, which includes the Back Basin (Joint Watershed Authority, 2005). Prior to this construction, in February 1980, a series of storms caused Lake Elsinore to rise to elevation 1265.7-feet above msl, causing substantial spill into Temescal Creek (personal communication, letter from R. Koplin, Chief, Engineering Division, S.C. Thomas, Senior Civil Engineer, Riverside County Flood Control District, dated August 15, 2003; USACE, 2003). After the flood control improvements were made, the highest peak flow recorded at USGS gage no. 11072100, Temescal Creek near the City of Corona, about 15 miles downstream from Lake Elsinore, was 4,030 cubic feet per second (cfs) on June 9, 2006 (USGS, 2005).

[10]/ EVMWD's Regional Wastewater Treatment Plant provides tertiary treatment to wastewater such that it can be reused in a variety of applications and is suitable for contact recreation.

Under normal conditions when Lake Elsinore is not spilling, Temescal Wash receives discharges of highly treated (tertiary) effluent from the EVMWD Regional Plant and excess recycled water from the EMWD Temescal Valley Water Reclamation Facility (MWH, 2005).

2.3.2 Decker Canyon Reservoir

The proposed Decker Canyon Reservoir site would be located on the west side of the Elsinore Mountains within the upper drainage of San Juan Creek which does not drain to Lake Elsinore. The Decker Canyon site is located at the headwaters of its drainage basin and would drain only about 90 acres (0.14 square mile). Below the Decker Canyon Reservoir site, San Juan Creek flows generally towards the west and has a 176 square mile drainage area at its point of discharge into the Pacific Ocean at Doheny State Park near Dana Point and Capistrano Beach in Orange County. Stream flows in the Decker Canyon site are seasonal and intermittent. San Juan Creek becomes perennial near the mouth of the basin, owing largely to development and urban runoff (about 35 percent of the watershed is urbanized), possibly due to effluent from waste water treatment plants and similar inflows during the dry season.

Streamflow in San Juan Creek since 1986 has been measured at USGS Gage No. 11046530, La Novia Street Bridge near San Juan Capistrano, which has a drainage area of 109 square miles. Table E.2-3 shows the annual stream flow data for this gage.

Table E.2-3: Daily discharge (cfs) statistics for USGS Gage No. 11046530 San Juan Creek at La Novia Street Bridge near San Juan Capistrano (Water Years 1987 to 2016) (cfs)

Mean	Maximum	Minimum	P10	P90
18.63	8120	0	0	9.6

Source: United States Geological Survey

2.4 Groundwater

The Project area is located within the South Coast Hydrologic Region. The South Coast Hydrologic Region has 56 delineated groundwater basins, eight basins of which are located in Subregion 8 (Santa Ana) and 27 basins are located in Subregion 9 (San Diego).

For the proposed northern primary transmission line, the area of the proposed Lake Switchyard is located within the Temescal Groundwater Subbasin (Basin No. 8.209). The subbasin underlies the southwest part of the upper Santa Ana valley. The Elsinore fault zone lies along the western boundary and the Chino fault zone crosses the northwestern tip of the subbasin. These fault zones are possible groundwater barriers. Dominant recharge is from percolation of precipitation on the valley floor and infiltration of stream flow within tributaries exiting the surrounding mountains and foothills.[11]

A portion of the proposed 230-kV transmission line upgrade traverses the San Luis Rey Valley Groundwater Basin (Basin No. 9.7). That groundwater basin underlies an east-west trending alluvium-filled valley in San Diego County. The major hydrologic feature is the San Luis Rey River which drains the valley overlying the basin. The basin is recharged by imported irrigation water applied on upland areas and by storm-flow in the San Luis Rey River and its tributaries. Movement of groundwater in the alluvial aquifer is westward towards the Pacific Ocean.[12]

The groundwater setting with respect to the pumped storage facility is described below.

[11]/ *Id.*, Upper Santa Ana Valley Groundwater Basin, Temescal Subbasin, updated January 20, 2006.

[12]/ *Id.*, San Luis Rey Groundwater Basin, updated February 27, 2004.

2.4.1 Elsinore Groundwater Basin.

Lake Elsinore is located in the Elsinore Groundwater Basin (Basin No. 8-4). The basin underlies the Elsinore Valley in western Riverside County, and extends under a surface area of 40.2 square miles in Elsinore Valley. The basin is bounded on the southwest by the Santa Ana and Elsinore Mountains along the Willard fault, a play of the active Elsinore fault zone. The basin adjoins the Temecula Valley Groundwater Basin on the southeast at a low surface drainage divide. The basin is bounded on the northwest by the Temescal Sub-basin of the Upper Santa Ana River Valley Groundwater Basin at a constriction in Temescal Wash. The basin is bounded on the northeast by non-water-bearing rocks of the Peninsular Ranges along the Glen Ivy fault.

Lake Elsinore lies in a closed basin formed between strands of the active Elsinore fault zone. The principal recharge of the basin is from infiltration of stream flow through alluvial fan deposits near the edges of the basin and through gravel deposits along the course of the San Jacinto River. Other contributing sources include infiltration from unlined channels, underflow from saturated alluvium and fractures within the surrounding bedrock mountains, and spreading of water in recharge basins.[13] Additional information concerning the Elsinore Groundwater Basin is contained in the EVMWD's "Elsinore Basin Groundwater Management Plan."

Table E.2-4: Estimated Groundwater Basin Budget for the Elsinore Groundwater Basin

Location	Average Location (1990–2000) (acre-feet per year)
Inflows	
Precipitation infiltration from rural areas	2,000
Precipitation infiltration from urban areas	800
Recharge from San Jacinto River	1,700
Recharge from Lake Elsinore	0
Return flows from applied water	600
Return flows from septic systems	1,000
Return flows via subsurface inflow	0
Total inflows	6,100
Outflows	
Groundwater pumping	7,900
Surface outflow	0
Subsurface outflow	0
Total outflows	7,900
Net Deficit	1,800

Source: MWH, 2003, as cited in Joint Watershed Authority, 2005

Lake Elsinore is underlain by layers of clay, which greatly impedes the downward movement of groundwater because clay acts as an impervious barrier. Due to the geological layout and the surrounding faults, the Elsinore groundwater basin is essentially a closed groundwater basin. The groundwater level in the basin has dropped considerably, with estimates of at least a 100-foot drop having occurred in the first half of the twentieth century alone (Joint Watershed Authority, 2005). Until recently, in addition to

[13]/ *Id.*, Elsinore Groundwater Basin, updated January 20, 2006.

groundwater withdrawal for irrigation and other needs, groundwater has been pumped from the EVMWD Island Wells, near Lake Elsinore to provide an additional source of water for Lake Elsinore under the pilot discharge project in an attempt to increase and stabilize lake levels. As indicated in Table E.2-4, an ongoing deficit of about 1,800 AF per year is estimated.

EVMWD developed a draft groundwater management plan for the Elsinore Basin, which was approved by its Board of Directors on March 24, 2005. The objective of the plan is to reverse the ongoing decline in groundwater levels and provide a long-term sustainable groundwater supply by recharging the basin with injection wells that would be located in the Lake Elsinore Back Basin and on the northwest side of the lake.

2.4.2 San Juan Creek Groundwater Basin.

The San Juan groundwater basin is a shallow basin that is essentially an underground flowing stream with limited storage capabilities. It is located under the San Juan Creek Watershed and tributary valleys in the southern part of Orange County, and is bounded to the west by the Pacific Ocean. Projects supporting groundwater recovery in the San Juan Creek groundwater basin have been initiated (Orange County, 2005).

The part of the groundwater basin near the area of the proposed Decker Canyon Reservoir site contains canyon bottomlands that are covered by alluvium and underlain by granitic bedrock. Evaporation amounts for the higher elevations associated with Decker Canyon Reservoir are estimated to be 38.2 inches per year, slightly lower than the 56.2 inches per year at Lake Elsinore.

With regard to San Juan Creek, the Corps notes that groundwater exists in a generally narrow, shallow alluvial valley fill that has been deposited in the San Juan Canyon area and its tributaries. Groundwater in these alluvial fill areas is unconfined. Groundwater studies indicate the alluvial fill ranges from reported depths of 200 feet at the coast to zero at the end of the small alluvial fingers tributary to the main canyons. The main structural feature influencing groundwater movement is the Cristianitos fault, which traverses the area in a north-south direction and crosses San Juan Canyon at a narrows, about 3.5 miles upstream from the confluence of San Juan and Trabuco Creeks. This fault and the narrows separate the groundwater alluvium into an upper and lower area.[14]

2.5 Water Quality

The proposed alignment of the transmission line crosses an estimated 6 USGS-depicted blue-line (jurisdictional) drainages. Most of these drainages are considered ephemeral. The route, however, crosses one major watercourse that contained flowing water during the Project’s general biological surveys (Temescal Wash). The Applicant is not aware of any available water quality data from Temescal Wash. With respect to the proposed generation facilities, water quality information is described below relative to existing water bodies and water quality constituents.

2.5.1 Lake Elsinore

Lake Elsinore’s morphology and location in a rapidly urbanizing area and upstream land use activities contribute to the quality of storm-water runoff that affects the water quality in the San Jacinto River and, ultimately, Lake Elsinore (Joint Watershed Authority, 2005). Consequently, the overall water quality of Lake Elsinore typically does not meet applicable water quality standards, and the California Regional Water Quality Control Board, Santa Ana Region (SARWQCB) has listed Lake Elsinore as impaired under

[14]/ *Id*., San Juan Creek Watershed Management Study, Orange County, California, Feasibility Phase, Hydrology Appendix, p. 82.

Section 303(d)[15] of the Clean Water Act (CWA) for nutrients, organic enrichment/low dissolved oxygen (DO), sedimentation/siltation, and unknown toxicity.

Lake Elsinore water quality objectives are set by the SARWQCB and published in the "Santa Ana Basin Plan". According to the "Santa Ana Basin Plan," the existing beneficial uses within Lake Elsinore[16] include contact recreation (REC1), non-contact recreation (REC2), warm freshwater habitat (WARM), and wildlife habitat (WILD).

Table E.2-5 shows the beneficial use designation definitions. Table E.2-6 presents objectives for algae, temperature, turbidity, DO, pH, and total inorganic nitrogen.

Lake Elsinore is a large, shallow lake marking the terminus for flows in the San Jacinto River. Development throughout the watershed has led to stream diversions and groundwater withdrawals preventing surface flows from reaching Lake Elsinore in all but the wettest years. Its high evaporation rate (56.2 inches annual average) coupled with its low annual precipitation (11.6 inches annual average) and relatively small watershed area results in a shallow lake for most of the year (Joint Watershed Authority, 2005). Annual precipitation and runoff vary widely, and so do lake levels along with the amount of exposed shoreline. Throughout its history, Lake Elsinore has been subject to periods of extreme flooding or drying due to the semi-arid climate of the area and varying runoff amounts.

The quality of the lake is also a function of lake levels. As lake levels fall because of low inflow or high evaporative losses, lake constituents such as nutrients and salinity become concentrated, and DO falls as the temperature of the shallower water rises in the summer (Joint Watershed Authority, 2004). These conditions are accompanied by algal blooms that exacerbate DO depletion, odors, and fish kills.

2.5.2 San Juan and San Mateo Creeks

Surface water in the upper San Juan Creek Watershed in proximity to the proposed Decker Canyon upper reservoir site is intermittent and directly related to precipitation. Because of the natural setting, surface flows originating from the upper watershed are of good quality during the brief times there is runoff, which is typically during winter rainy season. This contrasts with conditions in the lower watershed near the coast as creek water (limited groundwater mixed with urban nuisance flows) is strongly influenced by the expansive urban development surrounding the lower reaches and is consequently considered impaired under Section 303(d) for pathogens (specifically coliform bacteria).

The San Juan Creek watershed is under the jurisdiction of the California Regional Water Quality Control Board, San Diego Region (SDRWQCB) and subject to provisions of the "San Diego Basin Plan". The designated beneficial uses of San Juan Creek include agricultural and industrial process supply, contact and non-contact recreation, warm and cold fresh water habitat, and wildlife habitat. Table E.2-6 presents objectives for algae, temperature, turbidity, DO, pH, and total inorganic nitrogen.

15/ Under Section 303(d) of the Clean Water Act, states are required to submit a list of waters for which effluent limits will not be sufficient to meet all state water quality standards. The 303(d) listing process includes waters impaired from point and non-point sources of pollutants. States must also establish a priority ranking for the listed waters, taking into account the severity of pollution and uses.

16/ In 1988, the SWRCB adopted the Sources of Drinking Water Policy (Resolution No. 88-63) that directed the SARWQCB and the SDRWQCB to add the Municipal and Domestic Supply (MUN) Beneficial Use for all waterbodies not already so designated, unless they met certain exception criteria. Lake Elsinore is excepted under this provision.

Table E.2-5: Beneficial Use Designation Definitions

Beneficial Use	Definition
AGR	Agricultural Supply waters are used for farming, horticulture, or ranching. These uses may include, but are not limited to, irrigation, stock watering, and support of vegetation for range grazing.
COLD	Cold Freshwater Habitat waters support coldwater ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
IND	Industrial Service Supply waters are used for industrial activities that do not depend primarily on water quality. These uses may include, but are not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well re-pressurization.
RARE	Rare, Threatened or Endangered Species waters support habitats necessary for the survival and successful maintenance of plant or animal species designated under state or Federal law as rare, threatened or endangered.
REC1	Water Contact Recreation waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, and use of natural hot springs.
REC2	Non-contact Water Recreation waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
SPWN	Spawning, Reproduction, and Development waters support high-quality aquatic habitats necessary for reproduction and early development of fish and wildlife.
WARM	Warm Freshwater Habitat waters support warmwater ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
WILD	Wildlife Habitat waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.

Source: California Regional Water Quality Control Board, Santa Ana Region; California Regional Water Quality Control Board, San Diego Region

Table E.2-6: Applicable Water Quality Objectives for Waters Potentially Affected by the Proposed Project

Parameter	Santa Ana Basin Plan Objective	San Diego Basin Plan Objective
Algae	Waste discharges shall not contribute to excessive algal growth in inland surface receiving waters.	Does not exist.
Temperature	The temperature of waters designated WARM shall not be raised above 90°F June through October or above 78°F during the rest of the year as a result of controllable water quality factors. Lake temperatures shall not be raised more than 4°F above	Natural water temperatures of basin waters shall not be altered unless it can be demonstrated to the satisfaction of the San Diego Water Board that such alteration does not affect beneficial uses.

Parameter	Santa Ana Basin Plan Objective	San Diego Basin Plan Objective
	established normal values as a result of controllable water quality factors.	
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: 0–50 NTUs not to exceed 20%, 50–100 NTU increases not to exceed 10 NTU, greater than 100 NTUs not to exceed 10%.	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Inland surface waters shall not contain turbidity in excess of 20 NTUs more than 10% of the time during any 1-year period.
Dissolved Oxygen	Depressed below 5 mg/l for waters designated WARM, as a result of controllable water quality factors. In addition, waste discharges shall not cause the median DO concentration to fall below 85% of saturation or the 95th percentile concentration to fall below 75% of saturation within a 30-day period.	DO concentrations shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters designated COLD beneficial uses. The annual mean DO concentration shall not be less than 7 mg/l more than 10% of the time.
pH	The pH of inland surface waters shall not be raised above 8.5 or depressed below 6.5 as a result of controllable water quality factors.	The pH value shall not be changed at any time more than 0.2 pH units from that which occurs naturally.
Total Inorganic Nitrogen	1.5 mg/l	Does not exist.

Notes:
mg/l – milligrams per liter;
NTUs – Nephelometric turbidity units

Source: Santa Ana Water Board, 1995; San Diego Water Board, 1994

- **Water temperature.** The SARWQCB and others have been involved in water quality monitoring since June 2002 as part of improvement projects as discussed in Section 3.2 (Cumulatively Affected Resources). Since 2002, vertical lake sample profiles were conducted at over 10 positions located throughout Lake Elsinore. Vertical profiles taken at sampling site 9 (the deepest sampling site located in the central part of the lake) show strong seasonal differences in temperature, with daytime surface summer water temperatures reaching 29 to 30° Celsius (C), while the lower water column was typically 25 to 27°C. A transition to cooler temperatures begins in the fall, with the surface temperatures cooling to approximately 20°C in October. Water column temperatures then cool further, with temperatures ranging from 12 to 14°C from November to March. The lake generally begins warming in April, with modest stratification present during this time, while strong heating and stratification were observed in late May to early June.

  Water temperature data for waters in Decker Canyon in the upper San Juan Creek Watershed we provided in docket P–11858, and reported temperatures between 13.3 and 17.0°C (4 field measurements taken April 28, 2005, after a precipitation event). No water temperature data were collected for waters in San Mateo Creek in the upper San Mateo Creek Watershed. Decker Canyon only experiences surface flows during precipitation events, and therefore temperature data could not be collected for Decker Canyon surface flows. Sampling to date has not isolated the difference between storm water and seepage. San Mateo Creek only experiences surface flows during storm events, and temperature data do not exist for this watershed.

- **Dissolved oxygen.** The SARWQCB has listed Lake Elsinore as impaired for failing to meet numerous Santa Ana Basin Plan objectives, including DO objectives. Measurements that are below state objectives are continually recorded throughout the water column for the majority of the year. Low DO levels in the lake result from aerobic decomposition of algae and other organic material in the bottom waters, nighttime respiration of phytoplankton, plankton blooms, and higher water temperature (warm water contains less oxygen than cold water) during summer months. The SARWQCB has developed and implemented measures from the draft Total Maximum Daily Load (TMDL) for nutrients to improve water quality and reverse the presently compromised conditions.

  DO levels within Lake Elsinore exhibit spatial and temporal trends that vary with lake temperature and depth, which are dynamic throughout the year. In August 2002, oxygen was substantially depleted across the lake, resulting in a fish kill (levels recorded below 1 milligram per liter (mg/l) in the lower third of the water column). As the lake began to mix in October and November 2002, the lake generally exhibited higher concentrations but still reduced DO levels (5 mg/l) near the sediments relative to the surface (8 to 10 mg/l). This period of mixing was followed by a sharp decline in DO throughout the water column in early December 2002. Conversely, Lake Elsinore was generally well oxygenated during the winter of 2003. Historically, DO levels have been observed between 0.1 and 16 mg/l and vary greatly with season, temperature, and depth.

  The Applicant collected a single DO measurement of 8.9 mg/l from a sample collected from Decker Canyon in April 28, 2005. No DO data exist for waters in the upper San Mateo Creek Watershed. San Mateo Creek Watershed, due to its relative similarity (intermittent, upper-watershed setting in the same southern California mountain range) to Decker Canyon is assumed to exhibit similar water quality traits. As such, water (when present) within these upper watersheds is likely to be well oxygenated.

- **Nutrients.** The SARWQCB recognizes that the narrative water quality objectives set to protect the beneficial uses of Lake Elsinore are not being met as a result of high nutrient concentrations stimulating excessive algae growth and compromising DO levels. As such, Lake Elsinore is listed as impaired under Section 303(d) for nutrients, and this impairment requires the establishment of a TMDL for the pollutants causing the impairment (nitrogen and phosphorus).

  Lake Elsinore is technically eutrophic in that it exhibits the following characteristics: (1) large algae blooms (chlorophyll-a >50 micrograms per liter [µg/l]) and common presence of blue-green algae (cyanobacteria), specifically Microcystis; (2) large seasonal and daily swings in concentrations of DO; anoxic values that have been recorded in deeper waters during most summers; (3) low water clarity; Secchi disc values less than 1 meter; (4) high concentrations of inorganic nitrogen; and (5) high concentrations of total phosphorus. These observations substantiate the pilot "Lake Elsinore Recycled Water Project," an effort that enables EVMWD to discharge treated wastewater into Lake Elsinore to maintain higher lake levels to minimize effects from high evaporative losses and low inflow rates. This effort is designed to help restore the water quality of Lake Elsinore to meet state objectives.

  Sampling results show that the total phosphorus concentration in Lake Elsinore has generally been increasing between 2002 and 2004. Total phosphorus concentrations vary with the season but were generally observed at approximately 0.3 mg/l throughout the second half of 2002 and rising to approximately 0.5 mg/l in early 2004.

  Total nitrogen concentrations were variable between 2000 and 2004. Average summer concentrations were approximately 3.0 mg/l in 2000 and 2001 rising to approximately 5.0 mg/l in 2002 and 2003. Winter total nitrogen concentrations for all sampled sites from 2003 to 2004 averaged 11.8 mg/l; however, data presented by the Applicant exhibit considerable variability between days and pronounced swings seasonally and annually.

Sampling information provided in Docket P–11858 indicated that the total nitrogen: total phosphorus ratio was variable since sampling began in summer 2000. From summer 2000 through summer 2002, there were periods of strong phosphorus limitation (ratios up to 50:1), interrupted with periods during the winter of co-limitation (~15:1) and brief periods of nitrogen limitation (~5:1). The general trend has been moving toward nitrogen limitation.

Field sampling was conducted by the Applicant to characterize the waters of Decker Canyon following a precipitation event. The total nitrogen concentration below the Decker Canyon upper reservoir site was reported at 1.4 mg/l. All other samples were below the reporting limit.

- **Algae.** (Chlorophyll and Transparency). According to the SARWQCB, hyper-eutrophication (over enrichment of nutrients) of nitrogen and phosphorus is the most severe water quality problem in Lake Elsinore (SARWQCB, 2001). These elevated nutrient concentrations cause algae blooms that also result in low DO levels, which further result in fish kills. The presence of unsightly amounts of algae conflicts with the beneficial uses of Lake Elsinore, specifically WARM, REC-1, and REC-2, and is directly linked to the implementation of the nutrients TMDL. Chlorophyll concentrations show a slight seasonal trend with peaks in the late spring-summer. The SARWQCB recorded a maximum concentration of about 400 µg/l in fall 2002; however, 200 µg/l is a more typical concentration observed since 2003. Algae blooms are known to occur in the lake and result in floating mats of algae. These blooms typically occur in the summer to fall season but could potentially occur at anytime during the year when there are sufficient nutrients and ample sunlight. Secchi depths, an indicator of the lake's transparency, have been relatively stable at approximately 0.2 meter.

  Samples from the San Juan Creek and San Mateo Creek watersheds are not available to include in this discussion. Given the remote nature and the intermittent nature of the waters potentially affected by the Project and the low nutrient concentrations observed in field samples, it is unlikely that large amounts of algae as a result of nutrient enrichment would compromise the waters.

- **pH.** The SARWQCB sampling program has observed that the pH of Lake Elsinore has averaged slightly greater than 9 between April 2002 and June 2004, although the pH profiles show some vertical and temporal trends. The range of pH values recorded during this time period is 8.7 to 9.5. High pH values are often the result of the respiration of aquatic organisms (e.g., algae). The build-up of carbon dioxide in the water leads to a chain of chemical reactions that ultimately increase the alkalinity of the water (increased pH). The Applicant reported pH values between 7.42 and 7.65 from samples taken in Decker Canyon in December 2004 and April 2005 shortly after rain events. Information about the water quality of upper San Mateo Watershed is not available, but is likely to be similar to the waters in the upper San Juan Watershed.

Table E.2-7: San Juan Basin Water Quality Data (mg/l)

Subbasin	TDS	SO3	Iron	Mn
Lower San Juan	1500-2000	500-750	>2.0	0.5-1.5
Middle San Juan	500-1000	250-500	0.3-2.0	0.5-1.5
Upper San Juan	0-500	0-250	0-0.3	0-0.05

Source: Capistrano Valley Water District

The groundwater in the San Juan Creek watershed is typically high dissolved solids and salts. Table E.2-7 provides general groundwater quality data for 1987.[17] In general, groundwater quality problems

[17]/ *Id*., p. 84.

in the San Juan Creek watershed are related to high dissolved solids content, rather than bacteriological, toxins, or heavy metal concentrations.[18]

2.6 Potential Impacts on Water Resources

Impacts on water resources attributable to the Project generation facilities are discussed in Section 2.6.1. Impacts on water resources associated with the primary transmission connection are presented in Section 2.6.2. Potential cumulative impacts on water resources relating to the Project (inclusive of both transmission and generation) are presented in Section 2.6.3.

2.6.1 Potential Impacts of Project Generation Facilities

Lake Elsinore is a natural lake which is about five miles long and about two miles wide. It is a terminal lake and a natural low point in the San Jacinto River Basin; it does not connect with the Santa Ana River under normal rainfall conditions. In high precipitation and runoff years, the San Jacinto River flows through Lake Elsinore to the Santa Ana River via Temescal Wash, a natural drainage system that extends about 28 miles from Lake Elsinore to the Santa Ana River, which eventually drains to the Pacific Ocean. Lake Elsinore has overflowed to the northwest through Walker Canyon very rarely, only three times in the 20th Century and 20 times since 1769 based on Mission diaries. Each overflow event was short-lived demonstrating that Lake Elsinore is essentially a closed-basin lake system (FERC, 2007).

Lake Elsinore is an ephemeral lake, and water surface elevations have historically experienced significant fluctuations due to periods of flooding followed by prolonged dry periods. Lake Elsinore has dried completely on four occasions since 1769 (TNHC, 2007). Lake Elsinore has a relatively small drainage basin (<1,240 square kilometers) from which the San Jacinto River flows (semi-annually) into and terminates within the lake's basin. Lake Elsinore is a shallow lake (average depth of 24.7 feet) with a large surface area: (approximately 3,074 acres at elevation 1240-feet above msl). The main natural sources of water flowing into Lake Elsinore are direct natural runoff from the surrounding mountains and drainage from the San Jacinto River.

Annual average precipitation in the Lake Elsinore watershed is about 11.6 inches and the average annual evaporative loss is 56.2 inches. This excessive evaporative loss, when compared to the low natural inflow, results in unstable lake levels.

The primary source for make-up water is the EVMWD's Regional Water Reclamation Facility (RWRF), located adjacent to Lake Elsinore. The EVMWD relies on Water Rights Permit No. 30520 for an exclusive right to all water discharged from the reclamation plant. The EVMWD also can supplement make-up water with water from its island wells. The Applicant is also in discussions with the Eastern Municipal Water District (EMWD) as a potential supplier of tertiary treatment water that could be secured for discharge into Lake Elsinore. Water from those or other sources could be secured by the Applicant for Project operations.

Lake Elsinore has a long history of water quality problems, the most severe of which is hypereutrophication or the over-enrichment of the lake with the nutrients phosphorus and nitrogen. Elevated nutrient levels result in high algal productivity, leading to algal blooms that block sunlight to the water column and reduce photosynthesis of aquatic plants, creating low dissolved oxygen (DO) levels that result in periodic fish kills. The majority of oxygen produced by algal respiration is lost to the atmosphere rather than being dissolved in lake water. The decay of floating mats of algae is a chemical process that

[18]/ *Id*., San Juan Creek Watershed Management Plan, p. III-7.

further removes DO from the water column, exacerbating low oxygen levels experienced by the turbid water. The shallow lake depths and large surface area of Lake Elsinore allows water temperatures to increase dramatically during the summer months and high water temperatures support lower levels of DO. These complex processes result in excessive oxygen depletion that adversely affects aquatic biota, including fish.

Nutrient levels are elevated in Lake Elsinore from a combination of natural and anthropogenic causes. Nutrients tend to build up in terminal lake bottoms. Lake Elsinore is essentially the endpoint of a closed hydrologic system. Nutrient runoff from surrounding urban development, faulty septic systems, and dairy and agricultural operations contributes to the nutrient loading problem in Lake Elsinore. In addition, nutrient-rich sediment at the lake bottom is stirred up by the burrowing and bottom foraging behavior of introduced carp. Under conditions of low DO, phosphorus trapped in suspended sediment becomes bio-available to algae.

Lake Elsinore is listed by the State as “impaired” per Section 303(d) of the Clean Water Act (CWA) for failing to meet applicable water quality objectives, including DO levels. Measurements that are below State water quality objectives are continually recorded throughout the water column in Lake Elsinore for the majority of the year. The Lake Elsinore and San Jacinto Watershed Authority (LESJWA) installed a “lake mixing system” (axial flow pump aeration system) in 2004 and has initiated an environmental review process for an “aeration project” (diffused air in-lake aeration system) designed to increase oxygen levels in Lake Elsinore.

Pumped-storage electrical generation operations would involve the cycling of water between Lake Elsinore and a new upper reservoir, generating power with releases from the upper reservoir to Lake Elsinore and returning water to the upper reservoir for storage. This closed-loop cycling operation would be accompanied by upper reservoir water-level fluctuations of about 40 feet on a daily basis and about 75 feet during the course of a full-week cycle. In Lake Elsinore, the daily water-level fluctuation would be about one foot, with the lake level fluctuating about 1.7 feet during the course of a weekly cycle.

Significant hydraulic modification has already occurred in Lake Elsinore. However, potential effects during construction will include greater-than-normal lake-level draw downs to facilitate construction and initial filing. This would be a short-term impact and the drawdown elevation would largely be dictated by the hydrologic conditions present at that time. About 5,500 acre-feet (AF) of water would be needed for the initial filling of the upper reservoir. Since the Applicant proposes to obtain this water from recycled water sources available to the EVMWD and/or EMWD, effects on local potable water supplies would be negligible. Water use during construction is also a short-term impact and the Applicant would purchase the water needed from the EVMWD, the EMWD, or from other sources.

Construction of the intake/outlet structure would require work to be performed in Lake Elsinore. This work would be conducted within the confines of a cofferdam, which would limit the interface between the construction activities and lake water. Installation of the intake/outflow structure would require the removal of lake bed material which would be replaced with a steel and concrete structure. The structure would be backfilled and secured prior to removal of the cofferdam. Once the cofferdam is removed, the lake bed would be re-submerged. Based on the findings of technical studies conducted by the SARWQBC, construction activities are not anticipated to significantly disturb or re-suspend lakebed sediments (Anderson, 2006, 2007a, 2007b).

Table E.2-8 summarizes the potential water resource impacts of the Project.

Applicable PMEs which serve to mitigate potential hydrology and water quality impacts attributable to the Proposed Project are presented in Table E.2-11.

Table E.2-8: Potential Project Impacts on Water Resource

Impact	Description
H-3	Excavation could degrade groundwater quality in areas of shallow groundwater.
H-6	Accidental releases of contaminants from project facilities could degrade water quality.
H-7	Project construction or operation would potentially impact local water supply.
H-8	Project construction would deliver sediment resulting in increased turbidity.
H-9	Project reservoir would capture runoff.
H-10	Project operations could impact the quantity and quality of groundwater recharge.
H-11	Project operations could change water quality parameters.
H-12	Project operations could degrade water quality in San Juan Creek.

Source: The Nevada Hydro Company, Inc.

Impact H-3: Excavation could degrade groundwater quality in areas of shallow groundwater.

Construction of the Project Powerhouse, subsurface penstocks, and other associated electrical and water conduits (e.g., power shafts, power tunnels, penstocks, tailrace tunnels, and inlet/outlet structures) could intercept groundwater and daylight water now stored in underground aquifers. If substantial quantities of groundwater were to be encountered, both upslope and downslope areas can realize a decline in groundwater levels. A number of rural residents located within the Congressional boundaries of the CNF rely upon groundwater wells as their sole water source. Any loss of or disruption to groundwater supplying those wells could substantially affect those residents. This impact is potentially significant but would be mitigable to a less-than-significant level with the implementation of PME's H-3b and H-3c located inTable E.2-11.

Impact H-6: Accidental releases of contaminants from project facilities could degrade water quality.

Construction activities, including the construction of the new Decker Canyon Reservoir and an intake/outlet structure in Lake Elsinore, would require the placement, consumption, and storage of fuels, oils, lubricants, and other petroleum products and hazardous materials near existing water resources. The release or spill of petroleum products and/or hazardous substances into surface waters or streams located proximal to construction, operation, or maintenance activities could have negative effects on water quality, including corresponding impact on terrestrial and aquatic resources.

Lake Elsinore is a hypereutrophic lake and listed by the State as "impaired" under Section 303(d) of the CWA for failing to meet applicable water quality objectives for nutrients, organic enrichment/low DO, sedimentation/siltation, and unknown toxicity. The release of additional hazardous substances could exacerbate this condition. This impact is potentially significant but would be mitigable to a less-than-significant level through the development, implementation, and enforcement of a hazardous substances spill prevention and control plan, environmental safety plan, and hazardous substances response plan (PME H-7). In addition, implementation of PMEs H-2a, H-2b, H-2c will provide controls over the transport, use, storage, and disposal of hazardous materials and petroleum products associated with Project construction, operation, and maintenance activities.

Impact H-7: Project construction or operation would potentially impact local water supply.

Extensive tunneling will be required to construct the penstocks connecting the new Decker Canyon reservoir and the Powerhouse. Excavation activities associated with that tunneling could encounter and destabilize artesian groundwater systems. In addition, excavation for reservoir construction and the placement of a seepage collection system could destabilize localized artesian groundwater. Groundwater extent, including the depth to any underlying aquifer and hydrostatic pressures, will be determined through subsequent hydrogeologic investigations conducted by the Applicant prior to the start of construction (FERC, 2007).

Dewatering (groundwater pumping for construction) would likely be necessary for construction of the penstocks, tailrace tunnels, and intake/outlet structure; however, the effect is likely to be localized and for a short duration until a shaft casing could be installed. Long-term effects on the local and regional groundwater, such as the lowering of the piezometric surface, are not anticipated for the construction, operation, or maintenance of the proposed powerhouse, penstocks, tailrace, and intake/outlet structures. Additional groundwater level monitoring and geotechnical investigations will be conducted by the Applicant prior to the start of construction (FERC, 2007).

There are approximately 600 residents living downstream near the Ortega Highway–San Juan Creek crossing. The water source of these residents is dominated by groundwater supplies (FERC, 2007). Any disruption of the groundwater that serves those residents or any interruption to existing groundwater seeps discharging groundwater to the surface would be a potentially significant impact but would be mitigated to a less-than-significant level through compliance with FERC/USDA Forest Service requirements and implementation of PMEs H-3b and H-3c located in Table E.2-11.

Impact H-8: Project construction would deliver sediment resulting in increased turbidity.

Construction could increase turbidity in area streams and in Lake Elsinore through two primary pathways: (1) increased surface erosion; and (2) in-water construction activities. Construction activities could affect temperature, DO, and nutrient cycling and would likely contribute to continued and overall poor water quality in Lake Elsinore. Construction of the proposed Decker Canyon Reservoir would necessitate the removal of existing vegetation covering an approximately 150-acre area, exposing soils to increased erosion. Increased sediment loading in Decker Canyon would discharge to San Juan Creek. These impacts are significant but would be mitigable to a less-than-significant level through compliance with FERC/USDA Forest Service requirements and the implementation of PME H-1d, H-1e, and H-1f located in Table E.2-11.

Impact H-9: Project reservoir would capture runoff.

The San Juan Creek watershed encompasses a drainage area of 176 square miles (113,000 acres) extending from the CNF to the Pacific Ocean at Doheny State Beach, near Dana Point Harbor. The proposed approximately 100-acre Decker Canyon Reservoir is located in that watershed and captures a surface area representing less than 0.1 percent of that drainage basin.

Through the inclusion of a double-liner system (low-permeability liner material and a geomembrane) and collection system, the proposed Decker Canyon Reservoir is designed to preclude water retained in the reservoir (water imported from Lake Elsinore) from discharging to the San Juan Creek watershed. As a result, rainwater falling into the reservoir will also be contained therein.

The presence of the reservoir would preclude this captured water from flowing downstream into the San Juan Creek watershed. Interception of rainfall by the uncovered reservoir would be expected to be minimal on a watershed level. It is estimated that precipitation over the Decker Canyon Reservoir could contribute as much as 135 acre-feet per year (AFY) during an average year to the San Juan Creek watershed. This amounts to about one percent of the average runoff as measured at the La Novia Street Bridge Gage, approximately 17 miles downstream.

This resulting impact is less than significant and no mitigation is required.

Impact H-10: Project operations could impact the quantity and quality of groundwater recharge.

Operational waters used to generate at the proposed Project Powerhouse will be pumped from Lake Elsinore (Santa Ana Basin) into the proposed Decker Canyon Reservoir. The installation of a double-liner (low-permeability liner material and a geomembrane) and collection system and the maintenance of adequate freeboard at the proposed upper reservoir will maintain separation between the water within the reservoir and the surface and groundwater of the San Diego Basin, thus preventing any chemical constituent and biological transference between those basins. Experience with liners of the type proposed shows that leakage or failure would be unlikely. However, if the liner and collection system were to leak or otherwise fail, there could be a release of water originating from Lake Elsinore (Santa Ana Basin) into the surface waters of San Juan Creek (San Diego Basin), which could then infiltrate into groundwater supplies.

No planned releases of water from the Decker Canyon Reservoir to San Juan Creek are proposed. Unplanned releases, as may be associated with a failure of the retention and/or collection systems, would temporarily affect surface water quantity and could potentially affect surface and groundwater quality in the San Juan Creek watershed.

The proposed high-pressure water conduit (penstock) system would be aligned through the east side of the Santa Ana (Elsinore) Mountains. Construction will occur through a combination of tunnel boring machine (TBM) technology and conventional hard-rock mining techniques. Groundwater inflows into tunnel excavation can adversely affect groundwater, including contributing to groundwater withdrawal or depletion, as well as create additional issues (dewatering) with regards to the discharge of waters generated by construction operations.

If the native groundwater pressures exceed the tunnel pressures, native groundwater could seep into the tunnels and lower the groundwater level if the water table lies above the tunnel. Conversely, if pressure is greater inside the tunnel, water may seep into the native groundwater table and possibly raise the surrounding groundwater elevation. Because portions of the tunnels would be concrete lined, it is not anticipated that operation of the tunnels would result in any water diversion or otherwise adversely affect groundwater.

Operation of the underground Powerhouse could have localized effects on groundwater flow patterns. Groundwater may need to be pumped out of the powerhouse cavity and could potentially be redirected to Lake Elsinore at the surface.

Impact H-11: Project operations could change water quality parameters.

Project operation (the cycling of water between the upper reservoir and Lake Elsinore, the fluctuating shoreline, and the maintenance of facilities and the primary transmission lines) could potentially affect multiple water quality parameters within Lake Elsinore (SARWQCB) and San Juan Creek (SDRWQCB). Changing water levels could potentially cause shoreline soils to expand and contract, asserting a stress that eventually causes the soil structure to break down to the point of failure and resulting in erosion and sedimentation. As Lake Elsinore is already a heavily turbid lake, this unanticipated effect would not cause an adverse effect (Anderson, 2007a) and no mitigation is required.

Project operation could affect the temperature, DO, and nutrient cycling occurring in Lake Elsinore. Water transferred and stored at the upper reservoir during nighttime hours, and passing through the turbine during the day, could raise or lower water temperatures beyond current observed trends in Lake Elsinore. The pumping of water and operation of the turbines could aerate the water above existing levels and benefit water quality, while discharges could disturb bottom sediments and increase turbidity and alter the nutrient cycling in the reservoir. Changing lake level elevations could also stir up sediments, increasing turbidity and affecting nutrient cycling. Depending on other factors at the time of release, a large nutrient release could stimulate additional algal growth in Lake Elsinore. Each of these issues have been addressed through technical studies undertaken by the SARWQCB (Anderson, 2006, 2007a, and 2007b).

Transferring water from Lake Elsinore at night and returning it during daylight hours would have minimal impacts on water temperature (Anderson, 2006). Anderson surmises that the friction associated with moving the water through the generating units could slightly raise the temperature of the water while storage at higher elevation and transfer timing (at night) could result in slight decreases to the temperature. Given that the conduits would be underground where temperatures would be much cooler than the summer time air temperatures at the lake, any gains in temperatures due to friction would likely be negated by the surrounding conditions. These impacts would be less than significant and no mitigation is required.

Although impacts may be localized in the area of the outlet, operation of the Project could increase the concentration of DO in waters returning to Lake Elsinore (even without the planned oxygenation enrichment described in Exhibit A). The activity of transferring the water through the conduit, penstock pipes, and turbines in conjunction with a greater surface area to volume ratio within the upper reservoir would allow for a greater amount of oxygen to become dissolved in the existing stream waters than under current conditions. Maintaining oxygenated water throughout the water column prevents the nutrients stored within the sediments from being released into the water column, which reduces the amount available for use by algae thus improving water quality. Over time, as additional nutrients settle they become stored in the sediments as long as oxygenated conditions persist. Beneficial impacts to water quality are expected to be incremental.

Project operations would involve the cycling of water between Lake Elsinore and the proposed Decker Canyon reservoir. Although impacts may be localized in the area of the outlet, there is an expected beneficial increase in DO as a result of this daily water cycling. It is expected that, over time, Project operations should provide a measurable benefit to the annual mean water quality by using temperature and oxygen concentration differences between the upper and lower reservoirs to promote mixing of the water column and control internal nutrient loading within Lake Elsinore; however, the Project alone is not expected to improve water quality to the point where water quality objectives could be met. This water quality effect would be incremental relative to the effects outlined in the Lake Elsinore and San Jacinto Watershed Authority's (LESJWA) "Lake Elsinore Stabilization and Enhancement Project," which includes the installation of a mechanical aeration system to improve water quality and the importation of recycled wastewater to Lake Elsinore to stabilize lake levels. According to the Joint Watershed Authority (2005), dry lake conditions would be eliminated entirely, whereas, under current conditions, lake levels will be below 1225-feet above msl (close to empty) 20 percent of the time.

Because lake level stabilization is necessary for the operation of the Project, a long-term water purchase agreement, or similar document, will be negotiated and executed with the EVMWD and/or other water providers in order to ensure the long-term availability of water in Lake Elsinore at elevations above 1240-feet above msl. Such an agreement (as a PME) will enhance water quality parameters in Lake Elsinore.

Impact H-12: Project operations could degrade water quality in San Juan Creek (Class II).

The storage of Lake Elsinore water in the upper reservoir within the San Juan Creek watershed could negatively affect water quality in the San Juan Creek drainage. Spills or releases of water stored in the proposed Decker Canyon reservoir or leaks in the reservoir liner or collection system, membrane system, water conveyance system, or subterranean diversion structure that would allow the water from the proposed Decker Canyon reservoir to reach the San Juan Creek drainage could potentially degrade the water quality in the San Juan Creek watershed.

Impact H-13: Project operations could result in dam breach and a consequent loss of human life.

Proposed development plans have been modified to reduce the height of the reservoir and better conform to the existing topography. As now proposed, the dike has been eliminated and the water elevation of the stored water lowered. The following analysis addresses the conceptual design presented in this application

Because the proposed upper reservoir site is located near the headwaters of San Juan Creek, roughly coincident with the drainage divide between that watershed and that of Lake Elsinore, a dam failure could discharge water into San Juan Creek, and a failure could discharge water toward Lake Elsinore. Mode of failure in the Applicant's dam breach analyses were via a hypothetical piping failure; the hypothetical failure modes for the dike breach analyses included overtopping of the dike crest and internal erosion (piping) through the dike embankment materials.

FERC's Division of Dam Safety and Inspection's San Francisco Regional Office performed a Pre-License inspection and issued a report, dated January 6, 2005, during the Project No. 11858 proceeding. Paragraph A of the Pre-license Inspection Report discusses the downstream hazard potential of the project. The report notes that based on the dam break analyses included in the federal hydropower license application, a dam breach at the Decker Canyon Reservoir site would generate a flood wave that would cause overbank flow along San Juan Creek for about 15 miles to the Pacific Ocean. The areas subject to flooding include campgrounds, residential and commercial buildings, and Ortega Highway (State Route 74) stream crossings. The study estimates that depths could be as high as 39 feet in the narrow canyon areas. A similar study was performed to estimate inundation toward Lake Elsinore should an upper elevation dike fail. A dike breach could result in flooding, however, with less release of water. Structures and possibly residences in the City of Lake Elsinore would be inundated by up to six feet. The report notes that observations made during the inspection confirm that the Decker Canyon Reservoir would be classified as having a high downstream hazard potential. In accordance with the "Federal Guidelines for Dam Safety–Hazard Potential Classification Systems for Dams" (October 1998), dams assigned the high hazard potential are those for which failure or disoperation would probably cause loss of human life.

Inundation studies are conducted as a routine part of reservoir construction. The proposed reservoir's design must conform to both FERC and California Department of Water Resources, Division of Safety of Dams' (DSOD) dam safety requirements. In accordance therewith, substantial safety standards are required in order to minimize, to the maximum extent feasible, the potential for dam failure. Similarly, because electronic and visual monitoring of the reservoir will be required, evidence of potential safety considerations will be identified at the earliest possible time. If public safety conditions are identified, water in the upper reservoir can be released to Lake Elsinore and any remedial measures undertaken.

This impact could be potentially significant but would be reduced to a less-than-significant level through compliance with applicable federal and State design standards, including maintenance and monitoring requirements, and the implementation of the Applicant's proposed protection, mitigation, and enhancement measures (PME-H-1b and PME H-12) located in Table E.2-11.

2.6.2 Potential Impacts of Primary Transmission Line

The California Department of Water Resources (DWR) subdivides the State into regions for planning purposes. California is divided into ten Hydrologic Regions (HR). Of those, the primary transmission line is located in the South Coast Region. Each HR is further subdivided into six smaller, nested levels comprising Hydrologic Units (HUs), Hydrologic Areas (HAs), Hydrologic Sub-Areas (HSAs), Super Planning Watersheds (SPWSs), and Planning Watersheds (PWS).

Table E.2-9, lists the different hydrologic units, areas, and hydrologic sub-areas which are traversed by the primary transmission line in Riverside County.

The primary transmission line span a number of watersheds, including portions of the 765-square mile San Jacinto River and 2,650-square mile Santa Ana River basins north and west of Lake Elsinore. Both watersheds are administered by the Regional Water Quality Control Board, Santa Ana Region (SARWQCB).

Table E.2-9: Hydrologic Units, Areas, and Subareas

Hydrologic Unit	Hydrologic Area	Hydrologic Subarea
Santa Ana (801.00)	Lake Mathews (801.33)	Lee Lake (801.24)
San Jacinto (802.00)	Elsinore Valley (802.31)	-
San Juan (901.00)	Mission Viejo (901.20)	Upper San Juan Creek (901.25)
	San Mateo Canyon (901.40)	-
	San Onofre (901.50)	San Onofre Valley (901.51)

Source: The Nevada Hydro Company, Inc.

The proposed primary transmission line is located in the Santa Ana Basin. The major river systems within this basin include the San Jacinto and the Santa Ana Rivers. The San Jacinto River watershed originates in the San Jacinto Mountains, drains westerly into Canyon Lake and terminates in Lake Elsinore. Urban areas within this watershed include Gilman Hot Springs, Hemet, Lake Elsinore, Menifee, Moreno Valley, Perris, San Jacinto, Sun City, and Winchester. The San Jacinto River system is also included within the Santa Ana River watershed. Under normal rainfall conditions, the San Jacinto River ends at Lake Elsinore and does not connect with the Santa Ana River. However, during years with high precipitation and runoff, the San Jacinto River flows through to the Santa Ana River.

Table E.2-10 summarizes the potential water resource impacts of the primary transmission line.

Table E.2-10:Primary Connection and Upgrades – Water Resource Impacts

Impact	Description
H-1	Construction activity could degrade water quality due to erosion and sedimentation.
H-2	Construction activity could degrade water quality through spills of potentially harmful materials.
H-3	Excavation could degrade groundwater quality in areas of shallow groundwater.
H-4	Creation of new impervious areas could cause increased runoff resulting in flooding or increased erosion downstream.
H-5	Transmission towers or other aboveground project features if located in a floodplain or watercourse could result in flooding, flood diversions, or erosion.

Source: The Nevada Hydro Company, Inc.

Impact H-1: Construction activity could degrade water quality due to erosion and sedimentation.

Disturbed soils are susceptible to erosive processes and may be transported into downstream waters, compromising water quality. Construction of the new transmission alignment may, therefore, affect the rates of erosion and sedimentation, resulting in degraded water quality. Because of the inherent nature of overhead transmission systems (lines suspended above the ground surface), the construction of the majority of the proposed primary transmission lines is anticipated to produce relatively little effect on erosion and sedimentation. Transmission towers would be sited to avoid floodplain areas and thus minimize the potential for affecting watercourses. Trenching or tunneling for the underground segment and construction of maintenance roads, however, are expected to increase the potential for erosion and sedimentation, potentially affecting water quality.

The primary transmission line will span only one major stream along the proposed approximately 8.5-mile transmission alignment which could be affected during construction.

Impact H-2: Construction activity could degrade water quality through spills of potentially harmful materials.

Construction of the proposed primary transmission line would require the use of a variety of motorized heavy equipment including, but not limited to, 4x4 pickups, fuel trucks, cranes, dozers, forklifts, concrete trucks, backhoes, air compressors, graders, conductor pullers, shield tensioners, and drill rigs. Much of this equipment would require job-site replenishment of petroleum products and other hazardous materials, including oils, grease, coolants, lubricants, and other fluids. The accidental spill of these products, or similar construction-related materials, could lead to the discharge of contaminants onto the soil or into existing surface waters crossed by the proposed transmission line or at the site of the substations and switchyard.

Conveyance of contaminants could take place directly at the time of the spill or could be retained in place (such as soil contaminants) until a runoff event delivered them to a watercourse later or could infiltrate into the soil and/or groundwater below. A chemical spill affecting a water body, stream channel, wetland area, or groundwater is a potentially significant impact but would be mitigable to a level-that-significant level with the implementation of PMEs H-2a, H-2b, and H-2c, in combination with PME H-7.

In addition, the development, implementation, and enforcement of the hazardous substances spill prevention and control plan and hazardous substances response plan (PME H-7) would help to minimize the amount of hazardous materials and petroleum products that would enter surface and/or groundwater in the event of a spill.

Impact H-3: Excavation could degrade groundwater quality in areas of shallow groundwater.

Construction of the proposed transmission facilities, including the placement of any overhead towers and the construction of the new substation has only minimal potential to affect groundwater. However, construction of underground segments of the transmission line and construction of temporary and permanent access and spur roads could intercept, daylight, and/or destabilize shallow groundwater resources and may exist in the area of those construction activities.

The main effect of excavation and interception of groundwater and the daylighting of a slope is the draining of the groundwater that had been held in place by the removed soil. In topographic draws and creek valleys, such interception of groundwater can substantially dry up the area down slope, thus cutting off the supply of shallow groundwater and creating new surface drainage and/or flooding conditions. Upslope and downslope areas can realize a decline in groundwater levels. In arid environments, such effects could be profound for vegetation and the species that depend upon existing hydrologic conditionsThis impact is potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs H-3a and H-3b.

Impact H-4: Creation of new impervious areas could cause increased runoff resulting in flooding or increased erosion downstream.

Construction of the primary transmission line could result in an increase in runoff due to construction vehicles compacting pervious area, and the introduction of impervious surfaces along the underground transmission line and at the new substation.

Similarly, the construction of the new substation will result in a decrease in permeable surface areas as a portion of the site is replaced with concrete pads, asphalt paving, buildings, and other impervious surfaces. Although the extent of that coverage remains subject to final design plans, any change in the volume of surface water discharged from each site would not be expected to be significant based on the limited extent of each change in the context of the size of each affected watershed. PME H-4 will ensure that site-specific drainage can be safely conveyed from the proposed substation.

2.6.3 Potential Impacts of the Project

Cumulative impacts to water resources from the Project primary transmission line and generation would be similar to those presented in those two preceding sections.

Table E.2-11:PME's – Hydrology and Water Quality Impacts

Measure	Description
H-1a	Identify and mark sensitive areas for avoidance. Specific sites as identified by authorized agencies (e.g., fragile watersheds) where construction equipment and vehicles are not allowed shall be clearly marked on-site before construction or surface disturbing activities begins. Construction personnel shall be trained to recognize these markers and understand applicable equipment movement restrictions.
H-1b	Develop and implement construction Best Management Practices. (1) A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared and implemented. (2) Storm Water Best Management Practices (BMPs) for construction shall be implemented per the requirements of the project's SWPPP. (3) Silt fencing, straw mulch, straw bale check dams shall be installed, as appropriate to contain sediment within construction work areas and staging areas. Where soils and slopes exhibit high erosion potential, erosion control blankets, matting, and other fabrics and/or other erosion control measures shall be installed, as appropriate to contain sediment within construction work areas and staging areas. (4) The potential for increased sediment loading shall be minimized by limiting road improvements to those necessary for project construction, operation, and maintenance. (5) Upland pull sites shall be selected to minimize, to the extent feasible, impacts to surface waters, riparian areas, wetlands, and floodplains.
H-1c	Stream crossings at low-flow periods. Stream crossing shall be constructed at low-flow periods and, if necessary, a site-specific mitigation and restoration plan shall be developed.
H-1d	Compliance with NPDES regulations. The Applicant shall: (1) secure any required General Permit for Storm Water Discharges Associated with Construction Activities (NPDES permit) authorization from the RWQCB and/or SWRCB as required to conduct construction-related activities; and (2) establish and implement a SWPPP during construction to minimize hydrologic impacts.
H-1e	Construction routes to avoid and minimize disturbance to stream channels. To the extent feasible, where the construction of access roads would disturb sensitive features such as streambeds, the route of the access road shall be adjusted to avoid or minimize such impacts. Whenever practical, construction and maintenance traffic shall use existing roads or cross-county access routes (including the ROW) which avoid impacts to sensitive features. To minimize ground disturbance, construction traffic routes will be clearly marked with temporary markers, such as easily visible flagging. Construction routes, or other means of avoidance, must be approved by the appropriate agency or landowner before use. Where it is not feasible for access roads to avoid streambed crossings, such crossings shall be built at right angles to the streambeds, whenever feasible. Where such crossings cannot be made at right angles, where feasible, the Applicant shall limit roads constructed parallel to streambeds to a maximum length of 500 feet at any one transmission crossing location. Such parallel roads would be constructed in such a manner that minimizes potential adverse impacts on waters of the U.S. or waters of the State. Streambed crossings or roads constructed parallel to streambeds shall require review and approval of necessary permits from the USCOE, CDFG, RWQCB, and SWRCB.
H-1f	Construction on USDA Forest Service land to be subject to an approved, site-specific SWPPP and Sediment Control Plan. A site-specific sediment control plan and SWPPP shall be prepared for construction within the National Forest. These plans shall identify and characterize potentially affected water resources and provide post-construction remediation and monitoring details. The sediment control plan shall include construction in the dry periods (but not preclude

Measure	Description
	construction in the wet periods), as well as construction by helicopter in areas where terrain is steep and the potential consequences of sedimentation severe. These plans shall be submitted to the USDA Forest Service (on NFS lands) for review and approval prior to the commencement of construction.
H-2a	Groundwater testing and treatment before disposal. (1) In no case shall groundwater removed during construction be discharged to surface waters or storm drains without first obtaining any required discharge permits. (2) If dewatering is necessary, the water will be contained and sampled to determine if contaminants requiring special disposal procedures are present. (3) If the water tests sufficiently clean and land application is determined feasible per applicable SWRCB and RWQCB requirements, the water may be directed to relatively flat upland areas for evaporation and infiltration back to the water table, used for dust control, or used as makeup for a construction process (e.g., concrete production). (4) Water determined to be unsuitable for land application or construction use shall be disposed of in another manner, such as treatment and discharge to a sanitary sewer system in accordance with applicable permit requirements or hauled off the site to an appropriate disposal facility.
H-2b	No storage of fuels and hazardous materials near sensitive water resources. Storage of fuels and hazardous materials will be prohibited within 200 feet of groundwater supply wells and within 400 feet of community or municipal wells.
H-2c	Proper disposal and clean-up of hazardous materials. Hazardous materials will not be disposed of onto the ground, the underlying groundwater, or any surface water. Totally enclosed containment will be provided for trash. Petroleum products and other potentially hazardous materials shall be removed to a hazardous waste facility permitted or otherwise authorized to treat, store, or dispose of such materials. In the event of a release of hazardous materials to the ground, it will be promptly cleaned up in accordance with applicable regulations.
H-3a	Minimize impacts from road construction. To the extent possible, BMPs and sound road design practices cognizant of road construction effects shall be carried out to minimize the inherent effects of road construction on groundwater. In certain situations, there is no cost-effective alternative or mitigation for the adverse effects of hillslope road cuts on local groundwater. Unless authorized by the USDA Forest Service(on NFS lands), transmission towers shall be installed via helicopter in areas with slopes greater than 15 percent to minimize the potential effects of road cuts on groundwater.
H-3b	Compensate affected water supply. Should destabilization of artesian groundwater serving as water supply occur, the Applicant shall compensate delivery of additional water supply where a direct linkage between the Applicant's actions and a diminution of water supplies can be firmly affixed.
H-3c	Isolate underground powerhouse from groundwater flows. The Applicant shall use a combination of sealing and water control sumps to isolate the powerhouse from underground flows. The Applicant shall ensure that groundwater flow patterns at the proposed powerhouse site and penstock alignment are not adversely affected.
H-4	Install substation runoff control. The pad for new substations shall be constructed with a pervious and/or high-roughness surface where possible to ensure maximum percolation of rainfall after construction. If required, detention/retention basins shall be installed to reduce local increases in runoff, particularly on frequent runoff events. Downstream drainage discharge points shall be provided with erosion protection and designed such that flow hydraulics exiting the site mimics the natural condition as much as possible. A drainage design hydrologic and hydraulic analysis shall be provided at least 60 days prior to the initiation of construction.
H-6	Scour protection to include avoidance of bank erosion and effects adjacent property. A determination of towers requiring scour protection shall be made during the design phase by a

Measure	Description
	registered professional engineer with expertise in river mechanics. All towers within the project RPW shall be reviewed by the river mechanics engineer and the foundations of those towers determined to be subject to scour or lateral movement of a stream channel shall be protected by burial beneath the 100-year scour depth, setback from the channel bank, or bank protection provided as determined by the river mechanics engineer. An evaluation shall also be made regarding the potential for the tower and associated structures to induce erosion onto adjacent property. Should the potential for such erosion occur, the tower location shall be moved to avoid this erosion or erosion protection (such as rip rap) provided for affected properties.
H-7	Develop Hazardous Substances Response Plan for project operation. The Applicant shall prepare and implement a Hazardous Substance Control and Emergency Response Plan for project operation and a copy shall be kept on the site at substations. This plan shall include definition of an emergency response program to ensure quick and safe cleanup of accidental spills, including prescriptions for hazardous-material handling to reduce the potential for a spill during construction. The plan will identify areas where refueling and vehicle-maintenance activities and storage of hazardous materials, if any, will be permitted.
H 12	Develop and implement a water spill, release, and/or leak prevention plan. Unless otherwise addressed in any permit issued by the Federal Energy Regulatory Commission (FERC), the USDA Forest Service, and/or the California Division of Safety of Dams, at least 60 days prior to the commencement of construction of the upper reservoir, the Applicant shall file with the SWRCB a plan for protection of the San Juan Creek Watershed from any water spill, release, and/or leak. At a minimum, the plan shall require the Applicant to (1) maintain the project area appropriately sealed off from the San Juan Creek Watershed during construction and operation of the project; (2) to periodically test the upper reservoir for any leaks, releases, and/or spills; (3) to inform the SWRCB immediately of the nature, time, date, location, and action taken for any spill affecting the San Juan Creek Watershed; and (4) establish a protocol, to be approved by the SWRCB, for cleanup and monitoring any spill, release, and or leak.

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E
ENVIRONMENTAL REPORT
SECTION 3 – FISH, WILDLIFE, AND BOTANICAL RESOURCES

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

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3.1 Fish and Aquatics

3.1.1 Lake Elsinore Advanced Pump Storage Project

3.1.1.1 Existing Resources

Lake Elsinore supports warm-water fisheries consisting primarily of threadfin shad, common carp, bluegill, green sunfish, and limited populations of stocked gamefish, including largemouth bass. Lake Elsinore supports no native fish species. Being historically ephemeral, with resulting variable water levels, high water temperature, high alkalinity, and eutrophic conditions, the lake has provided marginal habitat for native fish. During wet years, Lake Elsinore was historically colonized by fish from the San Jacinto River (EIP Associates, 2005). The extreme conditions in Lake Elsinore have historically resulted in numerous fish kills and the lake currently supports an introduced aquatic community that is highly tolerant of this environment (EIP Associates, 2005). Little native riparian vegetation exists on the shore of the lake, and the lake does not support floating or submerged aquatic vegetation (EIP Associates, 2005).

Historically, Lake Elsinore was stocked with a variety of native and non-native fish. As early as the 1890’s, northern largemouth bass, green sunfish, and common carp were stocked in the lake. Through the years, often following fish kills, species of bass, bullheads, sunfish, crappies, and shad were stocked in the lake in an effort to create a recreational fishery. The common carp, one of the first fish species planted in Lake Elsinore, is currently prevalent in the lake. Carp tend to be abundant in eutrophic lakes and reservoirs with silty bottoms and submerged aquatic vegetation. They are tolerant of high turbidity, high temperatures, and low dissolved oxygen concentrations (Moyle, 2002). The common carp is now considered a nuisance species. Following surveys in 2003, the City of Lake Elsinore implemented a carp removal program, and an estimated 291,000 carp were removed from the lake (EIP Associates, 2005).

The Decker Canyon watershed is tributary to San Juan Creek. In 1996, USFWS biologists surveyed San Juan Creek from the I-5 Freeway to Hot Springs Canyon. During that seining, the USFWS collected one species of native fish, the arroyo chub and several non-native species, including mosquitofish, green sunfish, smallmouth bass, yellow bullhead, and red shiner (FERC, 2007). The arroyo chub is listed as a California species of concern because it is considered threatened in its home range. Project potential effects on the arroyo chub are addressed in Impact BR-7-AC.

The following discussion is based upon review of the Fisheries Management Plan for the Lake Elsinore,[1] the inventory from which is summarized in Table E.3-1. The dominant species in Lake Elsinore have shifted over time. In the early 2000’s the fishery was dominated by larger species such as carp, channel catfish and largemouth bass (in 2002). In more recent studies (2015 and 2019), threadfin shad, mosquitofish, silverfish and other small fish are the dominating species based on sampling .

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[1]/ Final Fisheries Management Plan For Lake Elsinore, prepared by EIP Associates for the Lake Elsinore & San Jacinto Watersheds Authority, August 2005. The Plan is available in Volume 10 of this application.

Table E.3-1: Fish Species Reported To Occur In Lake Elsinore

FAMILY Species (Common Name, *Scientific Name*)	Year Reported or Documented						
	1984[1]	1993[2]	2000[3]	2001[4]	2002[5]	2003[6]	2019[9]
CLUPEIDAE (Herring Family)							
Threadfin shad (Dorosoma petenense)	X	X			X	X	X
CYPRINIDAE (Minnow Family)							
Golden shiner (Notemigonus crysoleucas)	X						
Goldfish (Carassius auratus)						X	
Common carp (Cyprinus carpio)	X	X			X	X	X
Silverside Minnow (Menidia beryllina)							X
Mosquitofish (Gambusia affinis)							X
ICTALURIDAE (Bullhead Catfish Family)							
Black bullhead (Ameiurus melas)7							
Brown bullhead (Ameiurus nebulosus)		X					
Yellow bullhead (Ameiurus natalis)		X					
Channel catfish (Ictalurus punctatus)	X				X	X	X
SALMONIDAE (Salmon and Trout Family)							
Rainbow trout (Oncorhynchus mykiss)			X	X		X	
MORONIDAE (Striped Bass Family)							
Striped bass (Morone saxatilis)					X8		
CENTRARCHIDAE (Sunfish Family)							
Bluegill (Lepomis macrochirus)	X	X			X	X	X
Redear sunfish (Lepomis microlophus)	X					X	X
Green sunfish (Lepomis cyanellus)	X	X					X
White crappie (Pomoxis annularis)9	X?						
Black crappie (Pomoxis nigromaculatus)	X?	X			X	X	X
Largemouth bass (Micropterus salmoides)	X	X			X	X	X
CICHLIDAE (Cichlid Family)							
Tilapia (Tilapia spp.)	X						

Notes:

1. Reported in Lake Elsinore State Recreation Area General Plan (California Department of Parks and Recreation 1984).
2. Electrofishing data from the California Department of Fish and Game.
3. City of Lake Elsinore trout planting records and California Department of Fish and Game trout planting records.
4. California Department of Fish and Game trout planting records.
5. Electrofishing and gill net data from the California Department of Fish and Game. 6 EIP Associates seining data.
6. Listed in the City of Lake Elsinore's field guide titled Sport Fishing on Lake Elsinore, but not documented in California Department of Fish and Game records or collected during sampling in 1993 and 2003.
7. Newspaper documentation of angler harvest.
8. Listed in the City of Lake Elsinore's field guide titled Sport Fishing on Lake Elsinore, but not documented in California Department of Fish and Game records or collected during sampling in 1993 and 2003.
9. Wood. Lake Elsinore Fisheries Management Report. October 2019.

Threadfin Shad. Threadfin shad, which are native to tributaries to the Gulf of Mexico and the Mississippi River, were introduced into California in 1954. They typically inhabit open waters of reservoirs, lakes, and large ponds, and they can tolerate high salinities, although that may impair their reproduction. Threadfin shad prefer to swim near the surface, and are rarely found below 60 feet (Moyle, 2002). Threadfin shad was the most abundant fish species in Lake Elsinore in 2003, despite a massive die-off event that occurred in 1998. Optimal growth occurs when summer temperatures exceed 22 to 24°C; however, prolonged periods of cold water (4°C) will cause mortality (Moyle, 2002). The occurrence of threadfin shad in Lake Elsinore is the result of either stocking by CDFG or introduction when water from the Colorado River was transferred to Lake Elsinore from 1964 through 1966 (EIP Associates, 2005).

Goldfish. Goldfish were probably introduced to California waters and Lake Elsinore by aquarists and bait anglers. They become established in warm (>27°C), oxygen-deficient waters where winters are mild, and they thrive in polluted and disturbed habitats (Moyle, 2002), similar to those colonized by common carp. They feed on algae, zooplankton, and organic detritus.

Common Carp. The common carp, one of the first fish species planted in Lake Elsinore, is mostly likely to have recolonized the lake for the first time during the addition of Colorado River water to Lake Elsinore. The seed population likely originated in Canyon Lake. Carp are abundant in eutrophic lakes and reservoirs with silty bottoms and submerged aquatic vegetation. They are tolerant of high turbidity, high temperatures, and low DO concentrations and typically do not go below 100 feet (Moyle, 2002). It appears the majority of carp in Lake Elsinore are from a 1995 year class, and subsequent natural spawning has not produced prolific year classes. Predation by adult carp and competition for limited food supply are likely reasons for poor year-class survival (EIP Associates, 2005). The common carp is now considered a nuisance species. Following surveys in 2003, the city of Lake Elsinore implemented a carp removal program from June through September of that year. An estimated 291,000 carp were removed from the lake, most appeared to be from the 1995 year-class (EIP Associates, 2005).

Channel Catfish. The channel catfish was the third most abundant sport fish found in Lake Elsinore during surveys conducted in 2003. These fish were stocked in the lake in 2000, although few fish from this stocking effort were observed, and natural reproduction in the lake appears to be very low likely because of limited food resources. Channel catfish feed on amphipods and aquatic larvae when small and on aquatic insects and other fish and crayfish when larger. This species is tolerant of low DO, turbid, and high salinity conditions (Moyle, 2002). In streams, catfish move to shallow areas to feed at night and move to deep holes or shelters during the day, although little is known about their habitat preferences in lakes or reservoirs (Wydoski and Whitney, 2003).

Bluegill Sunfish. Bluegill sunfish prefer warm, shallow waters and can tolerate high salinities and low DO levels. They are also very temperature tolerant. They feed throughout the water column, eating a variety of aquatic insects and zooplankton, planktonic crustaceans, snails, small fish, and fish eggs, although they rarely are observed below 15 feet (Moyle, 2002). They are not common in the lake, and during seine surveys conducted in 2003, all bluegill appeared to be from the same 2000 year class. They do not appear to be reproducing successfully in the lake (EIP Associates, 2005).

Redear Sunfish. Redear sunfish prefer deeper (>6 feet deep) areas of warmwater lakes and ponds with aquatic vegetation. They are bottom-feeders, eating snails, clams, benthic insects, and aquatic plants. Only one specimen was captured in Lake Elsinore during seine surveys in 2003, and they do not appear to be reproducing successfully in the lake (EIP Associates, 2005)

Green Sunfish. In reservoirs, the green sunfish is typically found in shallow, weedy areas. This species is tolerant of high temperatures and low DO, although it is not tolerant of high salinities. The diet of the green sunfish comprises zooplankton and benthic invertebrates when small and larger aquatic insects, terrestrial insects, crayfish and fish when larger (Moyle, 2002). Little is known about current status of this species in the lake.

Black Crappie. Black crappie are often found in large warmwater lakes and reservoirs. Optimal temperatures for this species range between 27 to 29°C. Black crappie can withstand low DO levels for short periods and appear to tolerate high salinities. They can be found around large submerged objects during the day, and move offshore in the evening or early morning (Moyle, 2002). Black crappie appear to be reproducing in Lake Elsinore, and while they are not abundant, they are the most abundant sunfish found in the lake (EIP Associates, 2005).

Largemouth Bass. Largemouth bass are uncommon in Lake Elsinore; only two adults were captured in surveys conducted in 2003. They appear to prefer temperatures of 27°C, although they can persist in waters that reach to 37°C during the day and with DO levels as low as 1 mg/l. They prefer depths less than 20 feet and beds of aquatic plants (Moyle, 2002). Likely factors limiting successful reproduction are poor water quality, absences of suitable spawning habitat, limited food supply for juvenile fish, and nest destruction by common carp (EIP Associates, 2005). Largemouth bass were stocked into Lake Elsinore in 2005, and the Joint Watershed Authority intends to continue the stocking them in the future.

Rainbow Trout. Rainbow trout do not survive in Lake Elsinore for more than short periods because of unsuitable water quality and water temperature conditions. CDFG stocked rainbow trout in the lake to provide a novelty put-and-take fishery (EIP Associates, 2005). Rainbow trout are considered a coldwater species, preferring temperatures much cooler than those found in Lake Elsinore. Optimal rainbow trout habitat in lakes consists of clear water with an average summer temperature of < 22°C (Raleigh et al., 1984). The Fisheries Management Plan for Lake Elsinore does not include plans to stock Lake Elsinore with rainbow trout.

Wiper. Wipers are a sterile cross of white bass and striped bass. These fish are cultured in hatcheries and approximately 5,000 were stocked into Lake Elsinore in 2004, and 18,000 were stocked in 2005 (EIP Associates, 2005). Wipers, which are predatory on pelagic fish such as threadfin shad and young-of-the-year carp, are more tolerant of warmer water and lower DO than striped bass.

San Juan Creek. The headwaters for San Juan Creek, like San Mateo Creek, lie in the Santa Ana and Santa Margarita mountains, in the Trabaco Ranger District of the Cleveland National Forest. San Juan Creek is seasonal and intermittent near the headwaters and becomes a perennial stream in downstream reaches as flows are augmented by urban runoff. The channel is braided for most of its length; there are several gradient control structures in the main channel as well as a sand and gravel mining operation. Downcutting is occurring along the entire main stem, and the lower 2.6 miles have concrete banks and an earthen bottom (CERES, 2005).

On July 25, 1996, FWS biologists surveyed San Juan Creek from Interstate 5 east to just beyond Hot Springs Canyon. During the seining, FWS collected one species of native fish, the arroyo chub (*Gila orcutti*), and several non-native species, such as mosquitofish, green sunfish, smallmouth bass (*Micopterus dolornieu*), yellow bullhead (*Ameiurus natalis*), and red shiner (*Cyprinella lutrensis*).

3.1.1.2 Potential Impacts to Existing Resources

3.1.1.2.1 Construction Impacts

Construction or operational activities could adversely affect the movement of fish, and/or native wildlife nursery sites for mountain lion; for bat colonies and movement of fish; for linkages or wildlife movement corridors.

With the exception of Lake Elsinore, the Project does not occur in areas with perennial stream flows that support native fish species. Construction of the upper reservoir could, however, affect fish in San Juan Creek if sediment from construction activities were to be transported into stream flow into San Juan Creek. Potential adverse effects on fish in Lake Elsinore associated with Project operation would include mortality from entrainment and impingement. Attraction flows and/or suction caused by the intakes could be too strong for some Lake Elsinore fish to escape. Impacts on fish populations could be potentially significant but would be mitigated to a less-than-significant level with the implementation of PME BR-5b.

3.1.1.3 Proposed PME Measures

For PME BR-5b, Applicant proposes ongoing biological monitoring. Prior to construction, plant population boundaries designated as sensitive by USFWS or CDFG and other resources designated sensitive by the Applicant and resource agencies shall be clearly delineated with clearly visible flagging or fencing, which shall remain in place for the duration of construction. Flagged areas would be avoided to the extent practicable during construction activities in that area. Where these areas cannot be avoided, focused surveys for covered plant species shall be performed in conformance with PME BR-1c. The responsible resource agencies shall be consulted for appropriate mitigation and/or revegetation measures prior to disturbance. Notification of presence of any covered plant species to be removed in the work area shall occur not less than 10 work days prior to project activity, during which time the USFWS or CDFG may remove such plants or recommend measures to minimize or reduce the take. If neither USFWS nor CDFG has removed such plants within 10 work days following written notice, the Applicant may proceed with work and cause a take of such plants.

For PME BR-1c, Applicant proposes detailed on-the-ground protocol surveys, with regard to specific sensitive plants or wildlife species whose habitat would be impacted by the project based on final design, in accordance with State or federal regulations or statutes. Where applicable, the Applicant will submit the results of these surveys to the USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) and consult on reasonable and feasible mitigation measures for potential impacts, prior to any ground disturbing activities in a particular area. Mitigation could prioritize, but not be limited to, avoidance as the primary means to address impacts. If avoidance is not feasible, then relocation/restoration should be implemented. Where relocation/restoration is not feasible or deemed not to fully address impacts, then mitigation through on- or off-site purchase or dedication of habitat at the approved ratios and locations shall be identified and implemented.

Since sediment control measures will be implemented as part of the required Storm Water Pollution Prevention Plan (SWPPP) and will result in the control of discharges to all existing surface waters, including Lake Elsinore, San Juan Creek and San Mateo Creek, no impacts on native fish populations or movement are anticipated.

In addition to PME 5–b, described above, the Applicant proposes to consult with agencies and stakeholders with the objective of reaching agreement on new field surveys. These are anticipated to include updated habitat assessments using qualified biologists to conduct reconnaissance-level windshield and/or pedestrian surveys of the proposed project area. The surveys would focus on locations that could provide suitable habitat for sensitive species. They would search for wildlife and sign, and identify areas of potential impact. Data collected would include detailed mapping and potential habitat for sensitive species. All information would be recorded on standardized datasheets, and Global Positioning Satellite (GPS) data would be collected for vegetation communities and sensitive species. This information would be recorded in a format that can easily be incorporated into environmental documents.

Protocol-Level Surveys

If protocol-level surveys are required to determine the presence or absence of sensitive species, Nevada Hydro proposes to consult with agencies and stakeholders with the objective of reaching agreement on study protocols to perform surveys using qualified biologists deployed in locations that could provide suitable habitat for sensitive species. Data collected would include detailed mapping and potential habitat for sensitive species. All information will be recorded on standardized datasheets as well as GPS locations and boundaries. This information will be presented in a format that can easily incorporated into environmental documents.

Additional PMEs

In addition to the PMEs described above, Applicant proposes to adopt the PMEs described in the table below.

Table E.3-2: FERC Environmental Measures – Fisheries and Aquatic Resource Impacts Relating to the Pumped Storage Project

Measure	Description
	Federal Energy Regulatory Commission / USDA Forest Service **Final Environmental Impact Statement, Project No. 11858 (January 2007)**
BR-1 (EM-5)	Develop and implement a detailed plan specifying activities, locations, methods and schedules that the qualified environmental construction monitor will use to monitor construction in aquatic environments.
BR-2 (EM-6)	Conduct entrainment monitoring for one year and once every five years over the term of any license issued to the project to determine the extent of fish entrainment and mortality at the Lake Elsinore intake/outlet structures and provide the monitoring results to the CDFG, USFWS, SWRCB, and the Lake Elsinore & San Jacinto Watershed Authority (LESJWA), and, based on the results of entrainment monitoring, develop and implement a plan to mitigate for entrainment losses through measures, such as enhancing near-shore fish habitat or stocking fish, that would aid in establishment of naturally sustaining population of desirable sport fish.
BR-11 (EM-15)	Consult with USFWS during the process of developing final design drawings on measures to protect fish and wildlife resources.
	The Nevada Hydro Company - Protection, Mitigation, and Enhancement Measures Final Environmental Impact Statement, Project No. 11858 (Section 2.3.6)
BR-14 (PME-4)	Establish appropriate setbacks from streams, avoid sediment discharge, and implement BMPs identified by the Forest Service to avoid any effects on the existing steelhead recovery efforts in the San Mateo watershed as part of the erosion control plan.
BR-15 (PME-5)	Design and install physical barrier screens consistent with National Marine Fisheries Service criteria in areas of underwater intakes to minimize impingement and entrainment.
BR-16 (PME-6)	Establish limits of flow velocity rates of underwater intakes of less than 1.5 feet per section to reduce entrainment of fish.
BR-17 (PME-7)	Conduct monitoring for one year to determine the extent of fish entrainment and mortality at the Lake Elsinore intake/outlet structures and implement and test behavioral avoidance devices if entrainment is significant.
	The Nevada Hydro Company - Supplemental Protection, Mitigation, and Enhancement Measures **Final License Application for Major Unconstructed Project (April 2004)**
BR-24 (PME-B)	The Applicant, at least 180 days before the start of any land-clearing or land-disturbing activities at the project site, shall file, for FERC approval, detailed design drawings of the Applicant's proposed trashrack structure or fish screen to reduce the entrainment of resident fish, together with a schedule to construct/install the trashrack or screen before commercial operation of the project. This filing shall include, but not be limited to: (1) specifications of the size of the openings between the trashrack bars (e.g., not to exceed 1.5 inches); (2) the maximum intake approach velocity (e.g., not to exceed two feet per second); and (3) a description of the methods and schedule for installing the trashrack. The Applicant shall prepare the aforementioned drawings and specifications after consultation with the USFWS and State resource agency. The Applicant shall include with the drawings documentation of consultation, copies of agency comments and recommendations on the drawings and schedule after they have been prepared and provided to the agencies, and the specific descriptions of how the agencies' comments are accommodated by the Applicant's facilities. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the drawings and schedule with the FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. The FERC reserves the right to require changes to the proposed facilities and schedule. Project operation shall not begin until the Applicant is

Measure	Description
	notified, by the FERC, that the filing is approved. Upon FERC approval, the Applicant shall implement the proposal, including any changes required by the FERC.
BR-25 (PME-C)	At least 180 days prior to the start of project operation, the Applicant shall file with FERC, for approval, a plan for post-construction studies to monitor the effectiveness of the project facilities to reduce entrainment of fish in the project turbines and to allow for downstream fish passage. The monitoring plan shall include a schedule for: (1) implementation of the plan; (2) consultation with the appropriate federal and state agencies concerning the results of the monitoring; and (3) filing the results, agency comments, and Applicant's response to agency comments with FERC. The Applicant shall prepare the plan after consultation with the appropriate agencies and interested entities. The Applicant shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific description of how the agencies' comments are accommodated by the plan. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. FERC reserves the right to require changes to the plan. Project operation shall not begin until the Applicant is notified, by FERC, that the plan is approved. Upon FERC approval, the Applicant shall implement the proposal, including any changes required by FERC. If the results of the monitoring indicate that changes in project structures or operations, including alternative flow releases, are necessary to protect fish resources, FERC may direct the Applicant to modify the project structures or operations.
BR-28 (PME-F) (Cont.)	The Applicant shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. FERC reserves the right to require changes to the plan. No land-disturbing or land-clearing activities shall begin until the Applicant is notified, by the FERC, that the plan is approved. Upon FERC approval, the Applicant shall implement the plan, including any changes required by FERC. Within 90 days after completion of construction, the Applicant shall file "as built" drawings of the transmission line with FERC.

3.1.2 Primary Transmission Lines

3.1.2.1 Existing Resources

Few aquatic resources are located in areas directly affected by the primary transmission line. The largely urban route of the transmission corridor results in no crossings of perennial or seasonal watercourses with the exception of the Temescal Wash at the northern end of the transmission line.

3.1.2.2 Potential Impacts to Existing Resources

Potential impacts to biological resources within the area of the primary transmission lines are limited due to the paucity of aquatic habitat being traversed by the proposed powerline. The proposed crossing of the Temescal Wash could be installed either overhead or underground. If a subsurface installation is selected, water should be pumped around the construction site during the construction period to ensure flows are uninterrupted and water quality is unchanged. If above ground installation is selected, clearing of woody riparian vegetation should be minimized to only that required for safe construction and operation of the transmission line and the line should span the potentially wetted perimeter of the wash to avoid any inundation of transmission poles during flood periods and to avoid disruption to any habitat for aquatic species. Construction impacts

No construction impacts of the primary transmission lines to aquatic resources are identified.

3.1.2.2.1 Operation impacts

No operation impacts of the primary transmission lines to aquatic resources are identified.

3.1.2.3 Proposed PME Measures

Applicant proposes PME BR-4, pursuant to which Applicant will develop an Erosion Control Plan for application in both USDA Forest Service and non-USDA Forest Service lands. The plan will include measures to control erosion, stream sedimentation, dust, and soil mass movement attributable to the project. The plan shall be based on actual-site geological, soil, and groundwater conditions and will include:

- a description of the actual site conditions;
- detailed descriptions, design drawings, and specific topographic locations of all control measures;
- measures to divert runoff away from disturbed land surfaces;
- measures to collect and filter runoff over disturbed land surfaces, including sediment ponds at the diversion and powerhouse sites;
- revegetating disturbed areas in accordance with current direction on use of native plants and locality of plant and seed sources;
- measures to dissipate energy and prevent erosion; and
- a monitoring and maintenance schedule.

In addition to the PMEs just described, Applicant proposes to consult with agencies and stakeholders with the objective of reaching agreement on new field surveys. These are anticipated to include updated habitat assessments using qualified biologists to conduct reconnaissance-level windshield and/or pedestrian surveys of the proposed project area. The surveys would focus on locations that could provide suitable habitat for sensitive species. They would search for wildlife and sign, and identify areas of potential impact. Data collected would include detailed mapping and potential habitat for sensitive species. All information would be recorded on standardized datasheets, and GPS data would be collected for vegetation communities and sensitive species. This information would be recorded in a format that can easily be incorporated into environmental documents.

Protocol-Level Surveys

If protocol-level surveys are required to determine the presence or absence of sensitive species, Applicant proposes to consult with agencies and stakeholders with the objective of reaching agreement on study protocols to perform surveys using qualified biologists deployed in locations that could provide suitable habitat for sensitive species. Data collected would include detailed mapping and potential habitat for sensitive species. All information will be recorded on standardized datasheets as well as GPS locations and boundaries. This information will be presented in a format that can easily incorporated into environmental documents.

Table E.3-3: FERC Environmental Measures – Fisheries and Aquatic Resource PMEs Relating to the Primary Transmission Lines

Measure	Description
	Federal Energy Regulatory Commission / USDA Forest Service **Final Environmental Impact Statement, Project No. 11858 (January 2007)**
BR-1 (EM-5)	Develop and implement a detailed plan specifying activities, locations, methods and schedules that the qualified environmental construction monitor will use to monitor construction in aquatic environments.
BR-11 (EM-15)	Consult with USFWS during the process of developing final design drawings on measures to protect fish and wildlife resources.

3.2 Wildlife Resources

The FERC 2007 FEIS states: "The final EIS serves as the biological assessment for … federally listed species, for the purposes of consultation with the [US]FWS under Section 7 of the Endangered Species Act." In correspondence from FERC to the USFWS, dated May 22, 2007, FERC withdrew its "request for formal consultation on those species where we found likely effects on potential habitat, but for which survey information is not complete. If post-licensing surveys indicate that adverse effects could occur, we would initiate consultation with the Service. No land-disturbing activities that have the potential to affect listed species would be initiated until endangered species reviews have been completed."

3.2.1 Lake Elsinore Advanced Pump Storage Project

3.2.1.1 Existing Resources

There is no known significant migratory bird breeding habitat on the present shores of Lake Elsinore, which is subject to heavy human disturbance. Birds breed in shrubs and vegetation in the northern corner of the lake, back from the shore. A heron rookery is at least one-tenth of a mile from the water, in the Back Basin area. Double-crested cormorants are regularly observed at Lake Elsinore, likely to be foraging or wintering, as the only known rookery in western Riverside County is in the Prado Basin. Small breeding populations of snowy plover at Lake Elsinore were reported in the past, before the modification of Lake Elsinore into an operating lake (Main Basin) and separate Back Basin. Currently, with regard to existing shoreline conditions, lake level fluctuations, and high levels of human use around the margins of the lake preclude nesting by snowy plover. Suitable plover nesting substrates may be present within the loafing areas of the Back Basin. Caspian tern was reported nesting at Lake Elsinore. The available data reported 14 pairs in 1999 but none in the subsequent four years. Conditions around the lakeshore presently do not permit these or other open-substrate nesters to form breeding colonies on the main lake.

In accordance with the "Riverside County Multi-Species Habitat Management Plan" (MSHCP), most of the generation components occur in Core Area B. Core Area B represents a large proportion of the remaining habitat for mountain lions in the Santa Ana Mountain Range. Modeling of the mountain lion population indicates it is demographically unstable and at risk of extinction because it is isolated from other populations (Beier, 1993). A five-year study of mountain lions in the Santa Ana Mountains showed that one animal (a young male) occupied a home range that included the proposed Decker Canyon Reservoir site (Beier and Barrett, 1993).

There are only two bat species with the potential to occur in the Project area, one with low potential (pallid bat) and one with moderate potential (western red bat).

Migratory birds. Because it is subject to heavy human disturbance, there is no known significant migratory bird breeding habitat on the present shores of Lake Elsinore. Birds breed in the shrubs and vegetation in the northern corner of the lake, back from the shore. In the area of Lake Elsinore's Back Basin, a heron rookery is at least a tenth of a mile from the water. Double-crested cormorants are regularly observed at Lake Elsinore. This species is likely to be foraging or wintering since the only known rookery in west Riverside County is in the Prado Basin. In addition, small breeding populations of snowy plover have been reported in the past, before the modification of Lake Elsinore into an operating lake and the Back Basin. Existing shoreline conditions, lake level fluctuations, and high levels of human use around the margins of the lake preclude nesting by snowy plover. Suitable plover nesting substrates may be present within the loafing areas of the Back Basin.

In 2003, more than 300 Aechmoshorus grebes were found dead and emaciated at Lake Elsinore of unknown causes.[2] Numerous adult and juvenile Aechmophorus grebes (possibly both clarkia and occidentalis) were observed in the Back Basin and it appears that breeding occurs there. However, current lake fluctuations prevent the growth of macrophytes and shoreline marsh vegetation. There presently are no cattail or tule marshes within the lake shoreline, outside the Back Basin.[3]

As reported by the USFWS, with regard to the Caspian tern (*Sterna caspica*), a non-game migratory bird, Lake Elsinore "hosted an adult with a downy chick on 23 July 1995 and 14 nests on 7 June 1999. These represent the only known records of breeding Caspian terns in the interior of southern California away from the Salton Sea. In 1999, the terns were nesting on a low-lying island in a diked impoundment at the south end of Lake Elsinore; the rest of the lake is unsuitable, especially because it is heavily used for recreation."[4] Fourteen pairs of nesting Caspian tern were reported in 1999 and none in the subsequent four years. Conditions around the lakeshore presently do not permit this or other open-substrate nesters to form breeding colonies on the main lake, but the Back Basin loafing area may provide suitable nesting opportunities.

Lake Elsinore is a major body of water within the migratory flight pathway for numerous migratory bird species. Lake Elsinore and the surrounding areas provide suitable habitat for migration stop-overs and a refueling stop for migrant birds. Additionally, the area provides breeding habitat for several migrant bird species. However, because food productivity is low compared to other nearby lakes (Skinner, Mathews, Hemet), fewer birds use Lake Elsinore for migration stop-overs as compared to high productivity lakes such as the Salton Sea.

The State-listed bald eagle has high potential to fly through the general area to forage at Lake Elsinore.

No listed wildlife species were documented along or near the Project area. The listed QCB, arroyo toad, CGN, LBV, and SWF are believed to have moderate-to-high potential to occur in the general area based on the habitats present and the location of designated critical habitat for QCB and CGN. Multiple years of USFWS protocol surveys were conducted for these species, including: (1) six consecutive years for the QCB; (2) four years for the arroyo toad; and (6) six consecutive years for the CGN, LBV, and SWF. None of these species were found during those surveys. On March 19, 2008, the USFWS issued a "formal Section 7 consultation for the Lake Elsinore Advanced Pumped Storage Project (P-11858), Riverside County, California," authorizing an incidental take of arroyo toad. This is discussed further in Section 3.6: Rare, Threatened and Endangered Species.

3.2.1.2 Potential Impacts to Existing Wildlife

3.2.1.2.1 Construction Impacts to Wildlife

Effects to wildlife are extensively detailed in the FERC 2007 FEIS, especially in Volume 3 pages 108-147. The primary direct effects of construction on special status species and MIS would be loss of habitat as native plant communities are converted to project uses, and disturbance caused by noise, traffic, and human activity during the 4.5-year construction period. Construction of temporary access roads would cause indirect effects, as well, beyond the immediate road surface.

2/ Ivey, Gary L., Conservation Assessment and Management Plan for Breeding Western and Clarks Grebes in California, United States Fish and Wildlife Service, June 2004, p. 9.

3/ *Id*., Final Program Environmental Impact Report - Lake Elsinore Stabilization and Enhancement Project, SCH No. 2001071042, September 2005, Response No. 4-2.

4/ Shuford, David W. and Craig, David P., Status Assessment and Conservation Recommendations for the Caspian Tern (Sterna Caspia) in North America, United States Fish and Wildlife Service, August 2002, Appendix 1-16.

Loss of 31 acres of coastal sage scrub and 114.5 acres of chaparral would adversely affect Bell's sage sparrow, golden eagle, loggerhead shrike, southern California rufous-crowned sparrow, and the coast (San Diego) horned lizard, and would represent an additional habitat loss for mule deer. Loss of coastal sage scrub and chaparral would also reduce available habitat for Belding's orange-throated whiptail, northwestern red-diamond rattlesnake, Coronado skink, San Diego mountain kingsnake, coastal rosy boa, and northwestern San Diego pocket mouse.

Construction of a permanent maintenance road serving the primary transmission lines, with a total length of 5.2 miles, would primarily cross chaparral habitat, with about 0.25 mile extending through patches of coastal sage scrub near the Santa Rosa powerhouse site. Roads alter the characteristics of the habitats they cross by creating edge effects (Reed et al., 1996; Tinker et al., 1998). The distance that edge effects extend into habitat blocks varies from site to site. Animal responses to edge effects are also highly variable and may be described as occurring on a continuum from attraction to avoidance (Brehme, 2003).

Many wildlife species use narrow roads and hiking trails as travel routes. Reptiles often use them for thermoregulation, and birds may take advantage of forage plants that develop in edge habitats along road margins, and increases in small mammal populations that use them. However, roads also function as barriers to wildlife movement, and even narrow, unpaved roads with little vehicle traffic have been shown to interrupt the daily movements and seasonal dispersal of some small mammals, reptiles, and amphibians (Swihart and Slade, 1984; Weatherhead and Prior, 1992; Gibbs, 1998; deMaynardier and Hunter, 1995).

Noise and traffic would cause disturbance to wildlife throughout the construction period, which is estimated to last approximately 4.5 years. Species that are mobile (e.g., rufous-crowned sparrow, song sparrow, Cooper's hawk, loggerhead shrike, mule deer) would likely avoid the immediate area. Use of nearby habitats for breeding and possibly for foraging, as well, would be limited if such areas are already occupied. Less mobile species (e.g., San Diego horned lizard, red diamond rattlesnake) would experience adverse effects as a result of clearing, grading, and excavation.

3.2.1.2.2 Project Operation Impacts to Wildlife

At the proposed Decker Canyon Reservoir, facility operations present a potential concern regarding mosquito production and the potential for the infection of bird species with the West Nile virus. All species of mosquitoes require standing water to complete their life cycles. Factors that are conducive to mosquito breeding success in standing water include water-level stability, lack of wave action, high nutrient levels, and the presence of vegetative or other cover that affords protection of the larvae from predators or desiccation (TVA, 2004). The water level in the proposed upper reservoir would fluctuate up to 40 feet daily and up to 75 feet through the weekly cycle and the reservoir would not contain soils or support any vegetation. The reservoir's characteristics and operation would make the environment unsuitable for mosquitoes. Similarly, since Lake Elsinore is affected by the wave action produced by wind and boats, the lake is an unsuitable environment for mosquitoes. Therefore, there would be no impact to birds from West Nile virus associated with mosquito production.

The Applicant proposes to operate the Project so that daily fluctuations in the surface elevation of Lake Elsinore would be on the order of about one foot. A daily fluctuation of one foot would affect about 79 acres along the lake margin (e.g., between elevations 1240 and 1241-feet above msl). A weekly fluctuation of about 1.7 feet would affect an additional 55 acres (Anderson, 2006). The immediate shoreline of Lake Elsinore supports no native riparian vegetation. Vegetation near the shore in these areas consists of ornamental trees, shrubs, and flowers used in landscaping, or non-native weedy species that take hold in disturbed soils. Vegetation growing on the 2.5-mile-long levee that forms the southeastern shoreline is very sparse and consists mainly of non-native forbs and grasses.

There is no known significant migratory bird breeding habitat on the present shores of Lake Elsinore, which is subject to heavy human disturbance. Birds breed in shrubs and vegetation in the northern corner of the lake, back from the shore. A heron rookery is at least one-tenth of a mile from the water, in the Back Basin area. Double-crested cormorants are regularly observed at Lake Elsinore, likely to be foraging or wintering, as the only known rookery in western Riverside County is in the Prado Basin. Small breeding populations of snowy plover at Lake Elsinore were reported in the past, before the modification of Lake Elsinore into an operating lake (Main Basin) and separate Back Basin. Currently, with regards to existing shoreline conditions, lake level fluctuations, and high levels of human use around the margins of the lake preclude nesting by snowy plover. Suitable plover nesting substrates may be present within the loafing areas of the Back Basin. Caspian tern was reported nesting at Lake Elsinore. The available data reported 14 pairs in 1999 but none in the subsequent four years. Conditions around the lakeshore presently do not permit this or other open-substrate nesters to form breeding colonies on the main lake.

3.2.1.3 Proposed PME Measures

Nevada Hydro proposes to consult with agencies and stakeholders with the objective of reaching agreement on new field surveys. These are anticipated to include updated habitat assessments using qualified biologists to conduct reconnaissance-level windshield and/or pedestrian surveys of the proposed project area. The surveys would focus on locations that could provide suitable habitat for sensitive species. They would search for wildlife, and sign and identify areas impacted by wildfire and drought since 2006. Data collected would include detailed mapping and potential habitat for sensitive species. All information would be recorded on standardized datasheets, and GPS data would be collected for vegetation communities and sensitive species. This information would be recorded in a format that can easily be incorporated into environmental documents.

Protocol-Level Surveys

If protocol-level surveys are required to determine the presence or absence of sensitive species, Nevada Hydro proposes to consult with agencies and stakeholders with the objective of reaching agreement on study protocols to perform surveys using qualified biologists deployed in locations that could provide suitable habitat for sensitive species. Data collected would include detailed mapping and potential habitat for sensitive species. All information will be recorded on standardized datasheets as well as GPS locations and boundaries. This information will be presented in a format that can easily incorporated into environmental documents.

Based on the results of the literature review, input provided by the USFWS (USFWS 2014), and to update previous surveys, protocol level surveys may be required for a number of species. The list below may expand or be reduced in size based on the results of the habitat assessment and/or future input from state and federal resource agencies.

- Arroyo toad (*Bufo californicus*)
- California gnatcatcher (*Polioptila californicus*)
- Least Bell's vireo (*Vireo bellii pusillus*)
- Southwestern willow flycatcher (*Empidonax traillii extimus*)
- Quino checkerspot butterfly (*Euphydryas editha quino*)
- California spotted owl (*Strix occidentalis occidentalis*)

Table E.3-4: FERC Environmental Measures – Wildlife Resource PMEs Relating to the Pumped Storage Project

Measures	Description
	Federal Energy Regulatory Commission / USDA Forest Service **Final Environmental Impact Statement, Project No. 11858 (January 2007)**
BR-5 (EM-9)	Develop and implement a Lake Elsinore monitoring and remediation plan to address potential project-related effects on nesting shorebirds, waterfowl, and other birds.
BR-9 (EM-13)	Consult with the USFS annually to review the list of special status species and survey new areas as needed.
BR-10 (EM-14)	Develop and implement an annual employee awareness training program regarding special status plants and animals.
BR-11 (EM-15)	Consult with USFWS during the process of developing final design drawings on measures to protect fish and wildlife resources.

3.2.2 Primary Transmission Lines

The primary transmission line is located in a largely urban setting and therefore the lands tranversed are previously disturbed and provide limited potential impacts to wildlife. The Temescal Wash will be traversed near the northern end of the proposed primary transmission line.

Segments of the primary transmission line occur within designated critical habitat for the Quino checkerspot butterfly (QCB), coastal California gnatcatcher (CGN), and Munz's onion. QCB critical habitat occurs north of the I-15 Freeway. CGN critical habitat occurs along the northern portion of the primary transmission line route along several access roads.

3.2.2.1 Existing Wildlife Resources

Sensitive wildlife species, which are not listed as threatened or endangered under either the ESA or the CESA, were documented along or within proximity of the route of the proposed primary transmission line, although they were not observed during the 2001 – 2006 surveys: coastal California newt, coastal rosy boa, red-diamond rattlesnake, coast (San Diego) horned lizard, two-striped garter snake, Cooper's hawk, Southern California rufous-crowned sparrow, loggerhead shrike, and California spotted owl.

In 2006, the following non-listed, sensitive wildlife species were identified to have moderate to high potential to occur along or near the route of the primary transmission lines, based on the habitats present and/or documented CNDDB or USDA Forest Service records, although they were not observed during surveys: western spadefoot toad, Belding's orange-throated whiptail, San Diego ringneck snake, southwestern pond turtle, Coronado skink, San Diego mountain kingsnake, long-eared owl, Belding's orange-throated whiptail, Southern California rufous-crowned sparrow, coast (San Diego) horned lizard, coastal cactus wren, burrowing owl, white-tailed kite, northwestern San Diego pocket mouse, and western red bat. Sensitive species identified during the 2017 desktop review can be found in Section 3.5.

The National Forest Management Act of 1982 requires that the USDA Forest Service address Management Indicator Species (MIS) during the development of forest plans (USDA, 2005). The following five MIS are known to occur in the general area: Engelmann oak, mountain lion, mule deer, song sparrow, and California spotted owl. One other MIS, the arroyo toad, has potential habitat in the area but the species was not found during focused surveys.

Many of the species that occur in the project area can be found in several plant communities. In general, more complex plant communities support a greater number of wildlife species than less complex communities. Following are discussions of wildlife species that typically occur on the Project sites, segregated by taxonomic group. Representative examples of each taxonomic group observed during the 2001-2006 surveys are provided.

Invertebrates. Invertebrate activity was considered moderate during the biological and focused surveys due to weather conditions that were typically favorable. Sixteen different butterfly species were observed as well as several species of flesh flies, grasshoppers, and dragonflies.

Amphibians. Terrestrial species may or may not require standing water for reproduction and avoid desiccation by burrowing underground, within crevices in trees, rocks, and logs, and under stones and surface litter during the day and dry seasons. Due to their secretive nature, terrestrial amphibians are rarely observed. Aquatic amphibians are dependent on standing or flowing water for reproduction. Such habitats include freshwater marshes and open water (lakes, reservoirs, permanent and temporary pools and ponds, and perennial streams). The Project area has the potential to support a variety of amphibians in the moister woodland areas and canyon bottoms. Lake Elsinore as well as perennial and intermittent drainage features are considered suitable habitat for breeding amphibians. No vernal pools were observed on the sites during biological surveys; however, they may be nonetheless present in the general vicinity of the Project. Five amphibian species were observed during the field surveys: California chorus frog (*Pseudacris cadaverina*), canyon treefrog *(Hyla arenicolor*), Pacific chorus frog (*Pseudacris regilla*), Coast Range newt (*Taricha torosa torosa*), and western toad (*Bufo boreas*).

Reptiles. The Project sites have many essential reptilian habitat characteristics (disturbed open habitat with adjacent vegetation coverage) and have the potential to support a wide variety of species. Nine reptile species were observed within the Project area: western fence lizard (Sceloporus occidentalis), Coast (San Diego) horned lizard (*Phrynosoma coronatum blainvillii*), side-blotched lizard (*Uta stansburiana*), coastal western whiptail (Aspidoscelis tigris tigris), orange-throated whiptail (*Aspidoscelis hyperythra*), northern red-diamond rattlesnake (*Crotalus ruber rube*r), rosy boa (Charina trivirgata), gopher snake (*Pituophis melanoleucus*), and striped racer (*Masticophis lateralis*).

Birds. Scrubland and riparian habitats provide foraging and cover for year-round and seasonal avian residents and for migratory songbirds. In addition, there are several canyons and washes within the vicinity of the sites, as well as Lake Elsinore, that may provide a steady water supply for migratory birds. Several common avian species were observed during the biological and focused surveys. California towhee (*Pipilo crissalis*) and Bewick's wren (*Thryomanes bewickii*) were the most common species observed in coastal sage scrub. Western scrub-jays (*Aphelocoma californica*), bushtits (*Psaltriparus minimus*), and wrentits (*Chamaea fasciata*) were common in chaparral habitat. The oak woodland and southern willow scrub contained Nuttall's woodpecker (*Picoides nuttallii*), ruby-crowned kinglets (*Regulus calendula*), and yellow-rumped warblers (*Dendroica coronata*). The non-native grassland contained species such as western meadowlarks (*Sturnella neglecta*), song sparrows (*Melospiza melodia*), and western kingbirds (*Tyrannus verticalis*).

Many of the habitats (e.g., coastal sage scrub and non-native grassland) within the Project area provide optimal foraging opportunities for raptors and there are several perching locations within the surrounding areas. Evidence of nesting raptors occurred sporadically throughout the Project's sites. It is, therefore, likely that raptors nest within at least some portions of the Project area. Raptor species observed during surveys included red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperi*), American kestrel (*Falco sparverius*), great-horned owl (Bubo virginianus), barn owl (*Tyto alba*), California spotted owl (*Strix occidentalis occidentalis*), turkey vulture (*Cathartes aura*), and western screech owl (*Otus kennicottii*). The State-listed bald eagle has high potential to fly through the general area to forage at Lake Elsinore.

Rodents. Although the associated primary transmission line interconnection occurs in special habitat management areas for the SKR, focused surveys were not conducted for that species because presence was assumed and an in-lieu fee program (SKR Fee Assessment Area) has already been established to compensate for development impacts within those management areas.

Mammals. The diversity of habitats within the Project area is anticipated to support a variety of mammals. In most cases, mammal presence was deduced by diagnostic signs (track, scat, burrows). Mammal species observed or otherwise detected included Audubon's cottontail (*Sylvilagus audubonii*), dusky-footed woodrat (*Neotoma fuscipes*), California ground squirrel (*Spermophilus beecheyi*), mule deer *(Odocoileus hemionus*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and coyote (*Canis latrans*). Other large mammal species expected within the Project area, more specifically related to the primary transmission alignment, include mountain lion (*Felis concolor*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), and long-tailed weasel (*Mustela frenata*).

Regional connectivity/wildlife movement corridors.[5] Under 2007 conditions, wildlife have nearly uninhibited movement throughout the area northeast of the I-15 (Corona and Escondido) Freeway and within the CNF. Movement of terrestrial animals is restricted due to development in the area surrounding Lake Elsinore, as well as the unincorporated communities of Alberhill and Glen Ivy. Tracks and other sign of wildlife markings were noted extensively throughout the remaining parts of the Project area, indicating that wildlife movement is occurring. Most of the Project area is considered by the CDFG to be an important movement corridor for a variety of wildlife. Areas containing ridge tops and canyon bottoms are generally considered suitable corridors for wildlife. There are numerous canyons and ridge tops throughout the area; however, no detailed studies are available on wildlife movement through those areas.[6]

Due to the Project's location within the Western Riverside County MSHCP, the Project may potentially affect Linkage 1 and 9, and Constrained Linkages 3, 5 and 6, as described therein.

Although the associated primary transmission line occurs in special habitat management areas for the SKR, focused surveys were not conducted for that species because presence was assumed and an in-lieu fee program (SKR Fee Assessment Area) has already been established to compensate for development impacts within those management areas.

The following non-listed, sensitive wildlife species were documented along or near the Project area: coastal California newt, coastal rosy boa, red-diamond rattlesnake, coast (San Diego) horned lizard, two-striped garter snake, Cooper's hawk, Southern California rufous-crowned sparrow, loggerhead shrike, and California spotted owl.

The following non-listed, sensitive wildlife species have moderate to high potential to occur along or near the Project based on the habitats present and/or documented CNDDB or USDA Forest Service records: western spadefoot toad, Belding's orange-throated whiptail, San Diego ringneck snake, southwestern pond turtle, Coronado skink, San Diego mountain kingsnake, long-eared owl, burrowing owl, white-tailed kite, northern San Diego pocket mouse, and western red bat.

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[5]/ Wildlife corridors link areas of suitable habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially the larger and more mobile mammals, will not likely persist over time because the infusion of new individuals and genetic information is restricted or prohibited. Corridors effectively act as links between different populations of a species. The smaller the population, the more important immigration becomes because prolonged inbreeding between a small group of individuals can reduce genetic variability over time. A significant decrease in a population's genetic variability is generally associated with a decrease in population health and, eventually, extirpation.

[6]/ One area that is presumed to be a migration corridor is Temescal Wash, linking the Lake Mathews Estelle Wildlife Preserve (east of the I-15 Freeway) and the Santa Ana Mountains (west of the I-15 Freeway). Wildlife is free to move through this corridor under the two bridges where the I-15 Freeway crosses Temescal Wash.

3.2.2.2 Potential Impacts to Existing Wildlife

There are only two bat species with the potential to occur in the proposed project area, one with low potential (pallid bat) and one with moderate potential (western red bat). Impacts to a bat nursery colony could be significant if humans approached an active nursery colony, if entrances to nursery colony sites become blocked, if construction involves blasting or drilling causes substantial vibration of the earth/rock surrounding an active nursery colony, or if a structure occupied by bats, such as a bridge, were to be disturbed by construction. A bat nursery colony site is where pregnant female bats assemble (or one bat if it's of a solitary species) to give birth and raise their pups. These colonies could be located in rock crevices, caves, or culverts, inside/under bridges, in other man-made structures, and in trees (typically snags or large trees with cavities). In accordance with Significance Criteria 4 (Impede the use of native wildlife nursery sites), direct and indirect impacts to bat nursery colonies could be potentially significant but would be mitigable to a less-than-significant level with the implementation of BME BR-9b.

BR–9b proposes that a CDFG-approved biologist would conduct a habitat assessment for bat nursery colonies prior to any construction activity. Based on the findings of the habitat assessment, if suitable habitat is present, the approved biologist would conduct a survey for bat nursery colonies or signs of such colonies prior to construction. Direct impacts to a nursery colony site would not be allowed and approach of or entrance to an active nursery colony site is to be prohibited. Before any blasting or drilling in the vicinity of a nursery colony site, the CDFG-approved biologist should work with the construction crew to devise and implement methods to minimize potential indirect impacts to the nursery colony site from falling rock or substantial vibration (while a nursery colony is active).

3.2.2.2.1 Construction impacts to Wildlife

Removal of a non-native tree or shrub containing an active bird (raptor) nest could violate the MBTA and be a potentially significant impact but mitigable to a less-than-significant level with the implementation of BME BR-2, BR-6, BR-8, and BR-8. Likewise, removal of a native tree or shrub containing an active bird (raptor) nest could violate the MBTA and be a potentially significant impact but mitigable to a less-than-significant level.

Impact BR-6: Construction activities, including the use of access roads, would result in disturbance to wildlife and result in wildlife mortality. Adverse effects to general (non-special status) wildlife are anticipated from Project construction from the removal of vegetation and the temporary loss of wildlife habitat along with the displacement and/or potential mortality of resident wildlife species that are poor dispersers such as snakes, lizards, and small mammals. Construction may also result in the temporary degradation of the value of adjacent native habitat areas due to noise, increased human presence, and vehicle traffic. To the extent that these impacts were limited to non-special status species, they would be adverse but less than significant and no mitigation is required. Impacts to special status species are separately addressed herein.

Impact BR-8: Construction activities would result in a potential loss of nesting birds (violation of the Migratory Bird Treaty Act. The Project area contains a variety of vegetation communities providing sites for bird nests. Construction activities would disturb vegetation and could impact nesting birds. Ground-nesting birds, such as burrowing owl, could also be impacted by foot or vehicle/equipment traffic. The removal of vegetation and other construction activity, if conducted during the breeding season, could result in the displacement of breeding birds, abandonment of active nests, and accidental nest destruction. With the exception of a few non-native bird species, active bird nests are fully protected against "take" pursuant to the federal MBTA. In accordance therewith, it is unlawful to take, possess, or destroy the nest or eggs of any migratory bird.

The Project could have a significant impact if it was to violate the MBTA and result in the mortality of migratory birds or to cause destruction or abandonment of migratory bird nests and/or eggs (Significance

Criteria 1.g). A violation of the MBTA could be a potentially significant impact but would be mitigable to a less-than-significant level with the implementation of BMEs BR-8a and BR-8b.

Impact BR-9: Construction or operational activities would adversely affect linkages or wildlife movement corridors, the movement of fish, and/or native wildlife nursery sites. Construction at Decker Canyon would remove about 150 acres of suitable mountain lion habitat. Removal or disturbance of suitable habitat within Core Area B could result in additional adverse effects on mountain lions. In accordance with Significance Criteria 4.b (Interfere with connectivity or corridor or linkage), impacts to mountain lion habit are significant and not likely mitigable to a less-than-significant level. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

For other wildlife in Core Area B, the impacts to wildlife movement would be adverse but less than significant and no mitigation is required.

Impact BR-6: Construction activities, including the use of access roads, would result in disturbance to wildlife and result in wildlife mortality. Adverse effects to general (non-special status) wildlife are anticipated from construction of the primary connection from the removal of vegetation that would result in the temporary loss of wildlife habitat along with the displacement and/or potential mortality of resident wildlife species that are poor dispersers, such as snakes, lizards, and small mammals. Construction may also result in the temporary degradation of the value of adjacent native habitat areas due to noise, increased human presence, and vehicle traffic. To the extent that these impacts were limited to non-special status species, they would be adverse but less than significant and no mitigation is required.

PMEs BR-6a through BR-6d, in combination with BR-1a through BR-1h, BR-2a through BR-2c, BR-3, BR-4, and BR-5a through BR-5d, are nonetheless recommended to reduce the disturbance to wildlife and wildlife mortality to the maximum extent feasible.

Impact BR-7: Construction activities would result in direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife. Listed or sensitive (special status) wildlife species impacts could result from direct or indirect loss of known locations of individuals or direct loss of potential habitat as a result of temporary or permanent grading or vegetation clearing during construction of the primary connection. In addition, individuals near construction areas may temporarily abandon their territories due to disturbance from noise and human activity. A number of listed and non-listed, sensitive wildlife species have potential to occur.

Nine non-listed, sensitive wildlife species were observed in or near the primary connection study area. These species include coastal California newt, red-diamond rattlesnake, coast (San Diego horned lizard), two-striped garter snake, Cooper's hawk, southern California rufous-crowned sparrow, loggerhead shrike, southwestern willow flycatcher (SWFL), and California spotted owl. The non-listed willow flycatcher was observed within the area of Tenaja Canyon Creek during SWFL surveys but was not observed nesting within the study area. Although it is not conclusive that the species observed was indeed a SWFL, for the purposed of this analysis, it is assumed that the observed species was a SWFL, a California Species of Concern. Other non-listed, sensitive species have moderate-to-high potential to occur.

Most of the non-listed, sensitive species' habitats are sensitive vegetation communities; the mitigation for the loss of the sensitive vegetation communities (PME BR-1a) would normally compensate for the potential loss of these sensitive species and their habitats. However, since adequate suitable lands required by PME BR-1a may not be available, the impact to non-listed, sensitive wildlife species is significant according to Significance Criteria 2.a (Impacts that directly or indirectly cause the mortality of candidate, sensitive, or special status wildlife species) and not likely mitigable to a less-than-significant level. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

PMEs BR-7a through BR-7h, in combination with PMEs BR-1a through BR-1h, and BR-2a through BR-2c, are recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to non-listed, sensitive wildlife species.

The primary connection occurs in special habitat management areas for the SKR; focused surveys were conducted and this species was observed within the northernmost portion of the primary connection study area. An in-lieu fee program (SKR Fee Assessment Area) has already been established to compensate for development impacts within those management areas (Impact BR-7-SKR). No other listed wildlife species were documented along or near the route of the primary connection during multiple years of surveys for all species with potential to occur (QCB, arroyo toad, LBV, SWF, and CGN). These species are presently absent. Designated critical habitat for the QCB and CGN does, however occurs in the area. These species are addressed below under Impacts BR-7-QCB, BR-7-SKR, and BR-7-CGN, respectively. The State-listed bald eagle is separately addressed under Impact BR-10.

Impact BR-8: Construction activities would result in a potential loss of nesting birds (violation of the Migratory Bird Treaty Act. The primary connection study area contains a variety of vegetation communities that provide suitable habitat for nesting birds. Construction activities would disturb vegetation and have the potential to impact nesting birds. Ground-nesting birds, such as the western meadowlark and kildeer, could also be impacted by foot or vehicle/equipment traffic. The removal of vegetation and possibly other construction activity during the breeding season could result in the displacement of breeding birds, abandonment of active nests, and accidental nest destruction. With the exception of a few non-native bird species, active bird (raptor) nests are fully protected against "take" pursuant to the MBTA. It is unlawful to take, possess, or destroy the nest or eggs of any such bird.

The primary connection could have a significant impact if it was to violate the MBTA and result in the mortality of migratory birds or to cause destruction or abandonment of migratory bird nests and/or eggs (Significance Criteria 1.g). A violation of the MBTA could be a potentially significant impact but would be mitigable to a less-than-significant level with the implementation of PMEs BR-8a and BR-8b, in combination with PMEs BR-2b and BR-6b.

Impact BR-9: Construction or operational activities would adversely affect linkages or wildlife movement corridors, the movement of fish, and/or native wildlife nursery sites. Due to the intermittent locations and temporary nature of the primary transmission line construction activity, wildlife would not be physically prevented from moving around in the primary transmission corridor. During operation, the widely spaced towers would not physically obstruct wildlife movement; wildlife could move around or under the towers. Additionally, the creation of permanent access roads may, in some cases, make wildlife movement through otherwise dense vegetation easier.

However, the primary transmission line corridor passes through two Multi-Species Habitat Conservation Plan Core Areas (Core Areas B and C and a proposed core expansion area), and it crosses two Linkages between Core Areas. For the reasons stated above, the impacts to these Core Areas and Linkages are considered adverse but less than significant and no mitigation is required. An exception to this is for the mountain lion. Core Area B represents a large proportion of the remaining habitat for mountain lions in the Santa Ana Mountain Range. Modeling of the Santa Ana mountain lion population indicates it is demographically unstable and at risk of extinction because it is isolated from other populations (Beier, 1993). Removal or disturbance of suitable habitat within Core Area B would result in additional adverse effects on mountain lions. A five-year study of mountain lions in the Santa Ana Mountains showed that one animal (a young male) occupied a home range that included the primary transmission line corridor near Decker Canyon (Beier and Barrett, 1993).

The impact to Core Area B for the mountain lion is significant according to Significance Criteria 4.b (Interfere with connectivity or corridor or linkage) and not likely mitigable to a less than significant level.

PME BR-9a is recommended to reduce potential disturbance to the indigenous mountain lion population but would not likely prove effective in reducing impacts to this upper-tier species to below a level of significance. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level. PME BR-1a is recommended to reduce the impacts to the greatest extent feasible.

Although not likely available in sufficient size and possessing suitable habitat to support a lone male or breeding pair of lions, if off-setting compensatory resources could be identified and if that compensation were accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

There are only two bat species with potential to occur in the general area, one with low potential (pallid bat) and one with moderate potential (western red bat). Impacts to a bat nursery colony would be significantly impacted if humans approached an active nursery colony, if entrances to nursery colony sites become blocked, if construction involves blasting or drilling that causes substantial vibration of the earth/rock surrounding an active nursery colony, or if a structure occupied by bats, such as a bridge, were to be disturbed during construction. A bat nursery colony site is where pregnant female bats assemble (or one bat if it's of a solitary species) to give birth and raise their pups. These colonies could be located in rock crevices, caves, or culverts; inside/under bridges; in other man-made structures; and in trees (typically snags or large trees with cavities). In accordance with according to Significance Criteria 4 (Impede the use of native wildlife nursery sites), direct or indirect impacts to bat nursery colonies could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PME BR-9b.

Impact BR-10: Presence of primary transmission lines would result in electrocution of, and/or collisions by, listed or sensitive bird species. The primary consideration with respect to bird collisions with primary transmission towers or lines is during migration, especially in spring migration when strong winds and storms are more likely to force the birds to fly at relatively low altitudes. Most of this migration takes place at night. Mortality as a result of collision with these features would be greatest where the movements of migrating birds are the most concentrated.

One such area could be where the primary connection would cross Temescal Wash near Lee (Corona) Lake. This crossing could represent a high risk to waterfowl because of the presence of extensive wetlands and agricultural fields along the Lee (Corona) Lake shoreline. In addition to Temescal Wash, the northern segment of the primary connection would cross Cow Canyon, Horsethief Canyon, McVicker Canyon, Leach Canyon, Los Alamos Canyon, Tenaja, and San Mateo Creeks. Topographic maps indicate that McVicker Canyon and Leach Canyon may support moderate amounts of avian-supporting riparian vegetation and may thus pose a moderate risk of avian collision. Aerial photographs indicate that Los Alamos Canyon, Tenaja, and San Mateo Creeks support moderate amounts of riparian vegetation and may represent a moderate risk of line collision for some waterfowl and wading birds (FERC, 2007). These areas were highlighted because of their potential use by waterfowl or wading birds, but other types of birds could still be affected by collision with the primary transmission lines, towers, poles, or static wires.

Because avian migration corridors have never been studied systematically, there is no way to know how many birds and what species of birds could actually be impacted by collision with primary transmission and subtransmission lines, towers, poles, or static wires. Therefore, it is assumed that some species could be federal or State-listed or of other special status.

According to Significance Criteria 1.a (Impact one or more individuals of a species that is federal or State-listed), Significance Criteria 1.f (Directly or indirectly cause the mortality of candidate, sensitive, or special status wildlife), and/or Significance Criteria 1.g (Killing of migratory birds or destruction or abandonment of migratory bird nests and/or eggs), any mortality of those species would be a significant impact that is not likely mitigable to a less-than-significant level. If off-setting compensatory resources could be identified and if that compensation were accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

For non-sensitive species or species that migrate during the day, collision could be potentially significant according to Significance Criterion 1.f and 1.g. According to a local eagle expert (Bittner, 2007), eagles do not tend to be collision victims, except on the smaller distribution lines, because their eyesight is so acute. With the exception of an approximately 7.8-mile segment of rebuilt 69-kV subtransmission lines north of the City of Escondido (Talega-Escondido 230/69-kV Transmission and Substations Upgrades), the primary connection involves the construction of extra high voltage (230-kV and 500-kV) transmission lines. Bald eagle collision impacts are, therefore, expected to be less than significant.

PME BR-10, in combination with PMEs BR-7b and BR-12 are recommended to reduce impacts to eagles to the maximum extend feasible.

Impact BR-11: Presence of primary transmission lines would result in increased predation of listed and sensitive wildlife species by ravens that nest on transmission towers. Because primary transmission lines directly associated with the Project would be constructed underground, opportunities for perching or nesting by ravens would be limited.

Impact BR-12: Maintenance activities would result in disturbance to wildlife and wildlife mortality.

Impacts from maintenance activities would include impacts to nesting birds if vegetation is cleared during the breeding season and mortality of special status species from vegetation clearing or the use of access roads. Disturbance to wildlife and potential wildlife mortality from maintenance could result in potentially significant impacts if those activities were to impact listed species (Significance Criteria 1.a), directly or indirectly cause the mortality of candidate, sensitive, or special status species (Significance Criteria 1.f), violate the MBTA (Significance Criteria 1.g), and/or have a substantial adverse effect on riparian or other sensitive vegetation communities if weed species are introduced (Significance Criteria 2.b). These impacts could degrade wildlife habitat but would be mitigable to less-than-significant levels with the implementation of PMEs BR-3 and BR-5b.

Impacts to non-listed, sensitive wildlife species from maintenance activities could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PME BR-12. Maintenance activities could impact nesting birds (violate MBTA) if vegetation is cleared during the general avian breeding (January 15 through August15) or the raptor breeding (January 1 through September 15) seasons. This impact could be potentially significant but would be mitigable to a less-than-significant level through compliance with FERC/USFS requirements, in combination with the implementation of PMEs BR-8a, BR-8b, and BR-12a.

Impact BR-12: Maintenance activities would result in disturbance to wildlife and wildlife mortality. As indicated in a “Formal Section 7 Consultation for the Lake Elsinore Advanced Pumped Storage Project (P-11858), Riverside County, California,” as prepared by the United States Fish and Wildlife Service (USFWS), dated March 19, 2008, the USFWS states: “Potential effects to the arroyo toad include the crushing of arroyo toads inside and outside burrows due to ground disturbing activities and trampling associated with construction, maintenance and vegetation management activities proximal to Los Alamos Creek. Most of the proposed towers and access roads occur greater than 500 feet from the streambed in Los Alamos Creek and outside the 80-foot contour from the streambed, where arroyo toads are most likely to occur in upland habitats. One tower and access road occurs within 200-300 feet of a tributary to Los Alamos Creek. The potential for crushing of arroyo toads during construction and maintenance activities should be limited by the distance from the stream bottom, the temporal nature of construction activities, and the intermittent nature of potential maintenance activities. Further, vegetation management activities have the potential to open more area of upland habitat for toad use.”

Impacts to nesting birds could occur during maintenance activities if vegetation is cleared during the breeding season. Mortality of special status species could occur from grading, vegetation clearing, or the use of access roads. Disturbance to wildlife and potential wildlife mortality from maintenance could result in a potentially significant impact if those activities were to impact listed species (Significance Criteria 1.a), disturb critical habitat (Significance Criteria 1.d), directly or indirectly cause the mortality of candidate, sensitive, or special status species (Significance Criteria 1.f), violate the MBTA (Significance Criteria 1.g), and/or have a substantial adverse effect on riparian or other sensitive vegetation communities if weed species are introduced (Significance Criteria 2.b).

An impact to non-listed, sensitive wildlife species from maintenance activities could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PME BR-12, in combination with PME BR-6b.

Maintenance activities could impact nesting birds (violation MBTA) if vegetation is cleared during the general avian breeding (January 15 through August 15) or the raptor breeding (January 1 through September 15) seasons. This impact could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-6b and BR-12.

Impact BR-8: Construction activities would result in a potential loss of nesting birds (violation of the Migratory Bird Treaty Act). The Talega-Escondido transmission right-of-way contains a variety of vegetation communities that provide sites for bird nests. Construction activities would disturb vegetation and have the potential to impact nesting birds. Ground-nesting birds, such as the burrowing owl, could also be impacted by foot or vehicle/equipment traffic. The removal of vegetation and possibly other construction activity during the breeding season could result in the displacement of breeding birds, abandonment of active nests, and accidental nest destruction. With the exception of a few non-native bird species, an active bird (raptor) nest is fully protected against “take” pursuant to the federal MBTA. It is unlawful to take, possess, or destroy the nest or eggs of any such bird.

The upgrades could have a potentially significant impact if they were to result in a violation of the MBTA and result in the mortality of migratory birds or cause destruction or abandonment of migratory bird nests and/or eggs (Significance Criteria 1.g). A violation of the MBTA could be a potentially significant impact but would be mitigable to a less-than-significant level with the implementation of PMEs BR-8a and BR-8b, in combination with PMEs BR-2b and BR-6b.

Impact BR-9: Construction or operational activities would adversely affect linkages or wildlife movement corridors, the movement of fish, and/or native wildlife nursery sites. The Talega-Escondido transmission and subtransmission lines crosses numerous creeks and rivers, including Cristianitos Creek, San Mateo Creek, and Roblar Creek on Camp Pendleton, the Santa Margarita River along the northeastern portion, and Gomez Creek, San Luis Rey River, and Keys Creek on the Rainbow to Escondido portion (TNHC, 2007). Because the proposed upgrades would span these creeks and rivers, no impacts to fish and fish movement would be anticipated.

The 69-kV line upgrade crosses a 100-year and 500-year floodplain directly south of the Pala Substation and a few minor flooding areas exist to the north of the Lilac Substation. In those areas, spanning the floodplain may be infeasible. Where structures can be spaced far enough apart to span a FEMA-designated floodplain, no impact on fish habitat would result. However, where structures are located in designated 100-year floodplains, during periods of heavy rain, subtranmission poles may be partially inundated by rising waters. Since these events have only a one percent chance of occurring in any one year and since the area of any impedance to fish movement would be minimal, no impact is anticipated.

Similarly, since the proposed upgrades to the Talega-Escondido alignment primarily include the construction of a second circuit (Talega-Escondido No. 2) and the rebuilding of a segment of the existing 69-kV line, no impacts on mountain lions are anticipated.

Due to the intermittent locations and temporary nature of the transmission and subtransmission line construction activity, wildlife would not be physically prevented from moving around equipment. During the upgrades operation, the widely spaced towers and poles would not physically obstruct wildlife movement. Wildlife would be able to move around or under the towers and around the poles. Additionally, the creation of permanent access roads may, in some cases, make wildlife movement through otherwise dense vegetation easier.

Impacts to a bat nursery colony would be significant if humans approached an active nursery colony, if entrances to nursery colony sites become blocked, if construction involves blasting or drilling that causes substantial vibration of the earth/rock surrounding an active nursery colony, or if a structure occupied by bats, such as a bridge, were to be disturbed during construction. A bat nursery colony site is where pregnant female bats assemble (or one bat if it's of a solitary species) to give birth and raise their pups. These colonies could be located in rock crevices, caves, or culverts; inside/under bridges; in other man-made structures; and in trees (typically snags or large trees with cavities). In according with Significance Criteria 4 (Impede the use of native wildlife nursery sites), direct or indirect impacts to bat nursery colonies could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PME BR-9b.

The southern steelhead had thought to be extirpated from much of its historic range in southern California. In 1995, the California Department of Fish and Game (CDFG) reported that steelhead have been extirpated from at least eleven southern California steams, including San Luis Rey River, San Mateo Creek, Santa Margarita River, Rincon Creek, Maria Ygnacio River, Los Angeles River, San Gabriel River, Santa Ana River, San Onofre Creek, San Juan Creek, San Diego River, and Sweetwater River. In 1999, the first reoccurrence of a juvenile steelhead was observed in San Mateo Creek.

The "Cleveland National Forest Land Management Plan" states that "San Mateo Creek is one of the few remaining streams south of Los Angeles that is not dammed, and because of its location on federal lands, it has retained a pristine character. San Mateo Creek has an exceptionally high habitat quality for aquatic species. The San Mateo Creek Watershed supports the southernmost population of southern steelhead trout known to exist. The population is located on the lower reaches of the San Mateo Creek corridor and in Devil Canyon. The largest known population of sticky dudleya (a Region 5 sensitive plant species) is also located along San Mateo Creek in Devil Canyon, and at the confluence of Devil Canyon and San Mateo Creek (Devil's Gorge)" Construction of new transmission towers and access roads within this watershed could result in increased sediment loading and discharge into San Mateo Creek" (USFS, 2006).

As proposed, the Applicant will establish appropriate setbacks from streams, avoid sediment discharge, and implement BMPs identified by the USDA Forest Service to avoid any effects on the existing steelhead recovery efforts in the San Mateo watershed as part of the erosion control plan (PME BR-4). Since sediment control measures will be implemented as part of the required Storm Water Pollution Prevention Plan (SWPPP) and will result in the control of discharges to all existing surface waters, including San Mateo Creek, no impacts on native fish populations or movement are anticipated.

Impact BR-1: Project construction would result in temporary and permanent losses of native vegetation. The Talega-Escondido upgrades would entail, in part, the installation of a second 230-kV circuit on the vacant position of SDG&E's existing Talega-Escondido 230-kV transmission line and making upgrades to the Talega and Escondido Substations. In order to relocate the existing 69-kV circuit that now occupies a segment of the steel lattice towers, the Applicant proposes to rebuild and relocate that approximately 7.8-mile section between SDG&E's existing Pala and Lilac Substations and construct new 69-kV steel poles (PME F-2b) along the identified alignment.

It is assumed that no impacts to sensitive vegetation communities would occur from the use of pull sites to install the second 230-kV circuit because it is assumed that pull sites and staging areas would occur within existing developed and disturbed areas, within disturbed habitat, or along existing access roads. Impacts to developed and disturbed areas or disturbed habitat, should pull sites and staging areas not be located in existing access roads, would be adverse but less than significant.

In accordance with Significance Criteria 2.a (Substantial adverse effect on a riparian habitat or other sensitive natural community by temporarily or permanently removing it during construction, grading, clearing, or other activities), impacts to sensitive vegetation communities would be significant according to and not likely be mitigable to a less-than-significant level because adequate mitigation lands may not be available to compensate for the impacts. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

PMEs BR-1a through BR-1h are recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to sensitive vegetation communities.

A type conversion or substantial degradation of a native plant community from either multiple fire events or other causes would likely constitute a significant impact because of the severity of the habitat loss. While the impact would be significant and not mitigable to a less-than-significant level, independent analysis conducted by the Commission (CPUC, 2008) concludes that transmission lines are not a principal cause of wildland fires. As a result, since the 230-kV portion of the Talega-Escondido upgrade would not be a primary contributor to any such event, the impact attributable to the primary connection would be less than significant.

Because the alignment of the rebuilt 69-kV portion of the Talega-Escondido upgrade will primarily occur along the existing SDG&E rights-of-way and since construction and maintenance will be in accordance with and conformity to current electrical standards, the impacts of the Talega-Escondido upgrade on type conversion would be less than significant and no mitigation is required.

3.2.2.2.2 Project Operation Impacts to Wildlife

Primary transmission line maintenance activities including the use of helicopters, would cause short-term, localized, adverse less-than-significant impacts to wildlife.

Impact BR-12: Maintenance activities would result in disturbance to wildlife and wildlife mortality. Disturbance to wildlife and potential wildlife mortality from maintenance could result in a potentially significant impact if that disturbance were to impact listed species (Significance Criteria 1.a), disturb critical habitat (Significance Criteria 1.d), directly or indirectly cause the mortality of candidate, sensitive, or special status species (Significance Criteria 1.f), violate the MBTA (Significance Criteria 1.g), and/or have a substantial adverse effect on riparian or other sensitive vegetation communities if weed species are introduced (Significance Criteria 2.b). This impact could result in a degradation of wildlife habitat which would be mitigable with the implementation of PME BR-3.

Impacts to non-listed, sensitive wildlife species from maintenance activities could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PME BR-12, in combination with PME BR-6b.

Maintenance activities could impact nesting birds (violate MBTA) if vegetation is cleared during the general avian breeding (January 15 through August 15) or the raptor breeding (January 1 through September 15) seasons. This impact could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-6b and BR-12a.

Maintenance activities could impact the LBV, SWF, and CGN if the noise threshold (60 dB[A] Leq hourly) is met or exceeded at the edge of their nesting territories during their breeding seasons. This impact could be potentially significant but would also be mitigable to a less-than-significant level with the implementation of PMEs BR-6b, BR-7g, BR-7a (for LBV and SWF), and BR-12 (for CGN).

Maintenance activities could impact the golden eagle if they would to occur within 4,000 feet of an active nest. These impacts could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-7b and BR-12a.

Maintenance activities, including road maintenance that fills in water-holding basins or driving through such basins, could cause disturbance to and possible the mortality of Riverside (or San Diego) fairy shrimp. This impact could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PME BR-7h.

3.2.2.3 Proposed PME Measures

Nevada Hydro proposes to consult with agencies and stakeholders with the objective of reaching agreement on new field surveys. These are anticipated to included updated habitat assessments using qualified biologists to conduct reconnaissance-level windshield and/or pedestrian surveys of the proposed project area. The surveys would focus on locations that could provide suitable habitat for sensitive species. They would search for wildlife and sign, and identify areas impacted by wildfire and drought since 2006. Data collected would include detailed mapping and potential habitat for sensitive species. All information would be recorded on standardized datasheets, and Global Positioning Satellite (GPS) data would be collected for vegetation communities and sensitive species. This information would be recorded in a format that can easily be incorporated into environmental documents.

Protocol-Level Surveys

If protocol-level surveys are required to determine the presence or absence of sensitive species, Nevada Hydro proposes to consult with agencies and stakeholders with the objective of reaching agreement on study protocols to perform surveys using qualified biologists deployed in locations that could provide suitable habitat for sensitive species. Data collected would include detailed mapping and potential habitat for sensitive species. All information will be recorded on standardized datasheets as well as GPS locations and boundaries. This information will be presented in a format that can easily incorporated into environmental documents.

Based on the results of the literature review and input provided by the USFWS (USFWS 2014), protocol level surveys may be required for a number of species. The list below may expand or be reduced in size based on the results of the habitat assessment and/or future input from state and federal resource agencies.

- Arroyo toad (*Bufo californicus*)
- California gnatcatcher (*Polioptila californicus*)
- Least Bell's vireo (*Vireo bellii pusillus*)
- Southwestern willow flycatcher (*Empidonax traillii extimus*)
- Quino checkerspot butterfly (*Euphydryas editha quino*)
- California spotted owl (*Strix occidentalis occidentalis*)

Most of the non-listed, sensitive species' habitats are sensitive vegetation communities. Mitigation for the loss of the sensitive vegetation communities, as presented in PME BR-1a, would normally compensate for the potential loss of these sensitive species and their habitats. However, since adequate suitable land required by PME BR-1a may not be available, the impact to non-listed, sensitive wildlife species is significant according to Significance Criteria 2.a (Impacts that directly or indirectly cause the mortality of candidate, sensitive, or special status wildlife species) and not likely mitigable to a less-than-significant level. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

PMEs BR-1a through BR-1e, BR-1g, BR-2a, BR-3, BR-4, BR-5a through BR-5d, BR-6a, and BR-10 are recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to non-listed, sensitive wildlife species.

Although the associated primary transmission interconnection occurs in special habitat management areas for the SKR, focused surveys were not conducted for that species because presence was assumed and an in-lieu fee program (SKR Fee Assessment Area) has already been established to compensate for development impacts within those management areas.

Table E.3-5: FERC Environmental Measures – Wildlife Resource PMEs Relating to the Transmission Line

Measure	Description
	Federal Energy Regulatory Commission / USDA Forest Service **Final Environmental Impact Statement, Project No. 11858 (January 2007)**
BR-6 (EM-10)	Implement an avian protection plan consistent with Avian Power Line Interaction Committee and USFWS (2005) guidelines and over the term of any license issued for the project.
BR-7 (EM-11)	Conduct additional pre-construction special status plant and animal surveys at transmission line tower sites and along transmission alignment access road to ensure compliance with "Western Riverside County Multi-Species Habitat Conservation Plan" (MSHCP).
BR-9 (EM-13)	Consult with the USFS annually to review the list of special status species and survey new areas as needed.
BR-10 (EM-14)	Develop and implement an annual employee awareness training program regarding special status plants and animals.
BR-11 (EM-15)	Consult with USFWS during the process of developing final design drawings on measures to protect fish and wildlife resources.
	The Nevada Hydro Company - Protection, Mitigation, and Enhancement Measures **Final Environmental Impact Statement, Project No. 11858 (Section 2.3.6)**
BR-20 (PME-10)	Design and construct the primary transmission lines to the standards outlined in 1996 by the Avian Power Line Interaction Committee (APLIC).

3.3 Botanical and Wetland Resources

3.3.1 Regulatory Setting

The Native Plant Protection Act (Sections 1900-1913, CF&GC) (NPPA) requires all State agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of the NPPA prohibit the taking of listed plants from the wild and require notification of the CDFG at least ten days in advance of any change in land use. This allows the CDFG to salvage listed plant species that would otherwise be destroyed. The CDFG has also been directed by the State Legislature under State Senate Concurrent Resolution No. 17 (California Resolution Chapter 100) to conserve oak woodlands where CDFG has direct permit or licensing authority.

California Public Resources Code. As stipulated in Section 21083.4(b) of the PRC: "As part of the determination made pursuant to Section 21080.1, a county shall determine whether a project within its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county shall require one or more of the following oak woodlands mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands: (1) Conserve oak woodlands, through the use of conservation easements. (2)(A) Plant an appropriate number of trees, including maintaining plantings and replacing dead or diseased trees. (B) The requirement to maintain trees pursuant to this paragraph terminates seven years after the trees are planted. (C) Mitigation pursuant to this paragraph shall not fulfill more than one-half of the mitigation requirements for the project. (D) The requirements imposed pursuant to this paragraph also may be used to restore former oak woodlands."

Section 3.36 (Hydroelectric Project Management) in USDA Forest Service Handbook (FSH) 2509.22 (Soil and Water Conservation Practices Handbook) specified that it is the policy of the USDA Forest Service to "[l]ocate new hydroelectric ancillary facilities outside of RCAs [riparian conservation areas], wherever possible. Apply forest plans standard S47 and Appendix E."

3.3.2 Background

On March 1, 2006, FERC requested that the USFWS initiate formal Section 7 consultation with regards to the Project. In correspondence dated May 11, 2006 and June 9, 2006, the USFWS requested additional information from FERC. In their June 9, 2006 letter, the USFWS noted that "we do not concur that San Diego thornmint, Munz's onion, San Diego ambrosia, San Jacinto Valley crownscale, Nevin's barberry, slender-horned spineflower, San Diego button-celery, California Orcutt grass, thread-leaved brodiaca, spreading navarretia, California red-legged frog, southwestern willow flycatcher, and least Bell's vireo will not be or are not likely to be adversely affected." In response, as indicated in correspondence from FERC to the USFWS dated February 6, 2007, FERC stated that "[i]n your June 9, 2006 letter, you concurred with our finding in the draft EIS that construction of the Project would not affect Mexican flannelbush or designated critical habitat for the California red-legged frog and would not adversely affect the bald eagle. However, you did not concur with our findings that the project would not be likely to adversely affect the San Diego thornmint, Munz's onion, San Diego ambrosia, San Jacinto Valley crownscale, Nevin's barberry, slender-horned spineflow, San Diego button-celery, California Orcutt grass, thread-leaved brodiaea, spreading navarretia, California red-legged frog, arroyo toad, southwestern willow flycatcher, and least Bell's vireo. After further review, we have changed our findings to be consistent with your letter, with the exception of the red-legged frog. . .We continue to conclude that licensing the Project would not affect the California red-legged frog because the frog is not known to occur in the affected watersheds. We do not believe that formal consultation on this species is required."

A portion of the Project occur on undeveloped land within the CNF. The most prevalent community is chamise chaparral with patches of non-native grassland found on mesas and gentler slopes at higher elevations west of the Santa Rosa Plateau area. The upper reservoir site occurs within natural chamise-dominated chaparral plant community and coast live oak riparian woodland. The underground high-head water conductor (penstock) system cross through areas dominated by dense chamise chaparral above 1600 to 1800-feet above msl and coastal sage scrub habitat below. The proposed Santa Rosa Substation and Project Powerhouse and associated facilities will be located primarily within non-native grasslands. The low-head water conductor (tailrace) system would cross through developed areas, non-native grasslands, and then extend into Lake Elsinore. The Northern (Lake-Santa Rosa) segment of the proposed primary transmission line traverses a variety of plant communities with the lower elevation portion of that alignment being dominated by non-native grasslands and previously disturbed areas. The plant communities that are located along the Southern (Santa Rosa-Case Springs) segment of the proposed primary transmission line are dominated by dense chamise chaparral.

3.3.3 Pump Storage Project

The Applicant proposes to operate the Project so that daily fluctuations in the surface elevation of Lake Elsinore would be on the order of about one foot. A daily fluctuation of one foot would affect about 79 acres along the lake margin (e.g., between elevations 1240 and 1241-feet above mean sea level [msl}). A weekly fluctuation of about 1.7 feet would affect an additional 55 acres (Anderson, 2006). The immediate shoreline of Lake Elsinore supports no native riparian vegetation. Vegetation near the shore in these areas consists of ornamental trees, shrubs, and flowers used in landscaping, or non-native weedy species that take hold in disturbed soils. Vegetation growing on the 2.5-mile-long levee that forms the southeastern shoreline is very sparse and consists mainly of non-native forbs and grasses.

3.3.3.1 Existing Botanical and Vegetation Resources

For a variety of reasons, Lake Elsinore is unusual in that riparian and aquatic vegetation are virtually absent from the lake.[7] Archeological evidence from sites along the shoreline of Lake Elsinore, dating to the early Holocene, indicates that the lake never supported an extensive riparian community or an extensive rooted aquatic macrophyte community.[8]

The variability of water surface elevations at Lake Elsinore, beginning by the middle Holocene, indicates that the riparian and aquatic plants occurring along the lake shoreline that were not associated with a spring or other permanent water source, were continuously adjusting to the lake level and soil moisture conditions, as they do currently. Under such hydrological conditions, extensive areas of emergent aquatic vegetation or riparian vegetation would not be expected to develop or persists.[9]

Currently, little resembling a native plant community remains around the shoreline of Lake Elsinore. While the native willow (*Salix gooddingii*), cattail (*Typh latifolia*), and tule (*Scipus actutus*) remain in suitable habitats scattered around the lake, most of the lakeshore vegetation does not consist of true riparian species, but rather, non-native early serial stage colonizers that can grow on the exposed lakeshore as the water level recedes. [10]

Lake Elsinore does not currently support any species of floating or submerged, rooted aquatic macrophyte. The absence of a floating or submerged aquatic macrophyte community is a consequence of: 1) the variable water level from year-to-year and even seasonally within a year; 2) limited suitable shoreline sediments for rooting; 3) shading of light by the dense algal populations; 4) turbidity; and 5) the constant foraging of the common carp across the bottom. In the absence of a relatively stable lake level, aquatic plans cannot become established and persist.[11]

A variety of invasive, non-native plant species are known to occur in the Project area. These include red brome, black mustard, castor bean, tree tobacco, Russian thistle, yellow sweet clover, bristly ox-tongue, and giant reed.

3.3.3.2 Potential Impacts to Botanical and Vegetation Resources

Impacts on biological resources attributable to the Project are discussed below and shown in Table E.3-6. Impacts on biological resources associated with the primary connections are presented in Section 3.3.3.2.

Table E.3-6: Impacts to Vegetation Communities (Approximate acres)

Vegetation Community	Decker Canyon Reservoir	Project Powerhouse	Construction Staging Areas	Total Impacts
Non-Native Vegetation, Developed Areas, and Disturbed Habitat				
Coastal sage scrub	-	48.3	4.4	52.7
Grasslands and Meadows				
Non-native grassland	-	0.8	27.9	28.7
Chaparrals				

[7]/ EIP Associates, Fisheries Management Plan for Lake Elsinore, Riverside County, California, August 2005 p. 2-51

[8]/ EIP Associates, Fisheries Management Plan for Lake Elsinore, Riverside County, California, August 2005 p. 2-53

[9]/ EIP Associates, Fisheries Management Plan for Lake Elsinore, Riverside County, California, August 2005 p. 2-53

[10]/ EIP Associates, Fisheries Management Plan for Lake Elsinore, Riverside County, California, August 2005 p. 2-54

[11]/ EIP Associates, Fisheries Management Plan for Lake Elsinore, Riverside County, California, August 2005 p. 2-53 – 2-54.

Vegetation Community	Decker Canyon Reservoir	Project Powerhouse	Construction Staging Areas	Total Impacts
Northern mixed chaparral	96.7	-	47.0	143.7
Woodlands and Forests				
Coast live oak woodland	4.7	-	0.9	5.6
Herbaceous Wetlands, Freshwater, and Streams				
Freshwater (open water)	-	-	3.8	3.8
Total	**102.3**	**52.8**	**101.8**	**256.9**

Calculations of plant communities and impacts thereupon, as presented herein, are subject to further change and refinement based on additional engineering analyses, continuing biological resource assessment and subsequent agency consultation.

Impacts to sensitive vegetation communities would be significant according to Significance Criteria 2.a (Substantial adverse effect on a riparian habitat or other sensitive natural community by temporarily or permanently removing it during construction, grading, clearing, or other activities). This impact is not likely mitigable to a less-than-significant-level because it is unknown if enough mitigation lands are available to compensate for the impacts. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

PMEs BR-1a through BR-1h are recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to sensitive vegetation communities. Impacts to non-sensitive vegetation (i.e., disturbed habitat and non-native vegetation) would be adverse but less than significant and no mitigation is required.

There are approximately 408 coast live oaks associated with the proposed Decker Canyon Reservoir. It has been estimated that up to approximately 50 native oak trees would be removed for the reservoir's construction. The loss of native trees and shrubs could be a potentially significant impact if that loss were to result in: (1) Substantial adverse effect on candidate, sensitive, or special status species (Significance Criteria 1); (2) Substantial adverse effect on riparian habitat or other sensitive natural community (Significance Criteria 2); (3) Substantial adverse effect on federally protected water quality or wetlands (Significance Criteria 3); (4) Interfere with wildlife movement or the use of native wildlife nursery sites (Significance Criteria 4); and/or (5) Conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (Significance Criteria 5).

3.3.3.2.1 Construction Impacts to Botanical and Vegetation Resources

Impact BR-1: Construction activities would result in temporary and permanent losses of native vegetation.

As indicated in Table E.3-6, construction of the generation (pumped storage) components would cause both temporary (during construction from vegetation clearing) and permanent (displacement of vegetation with associated facilities, such as a reservoir and powerhouse) impacts to vegetation communities. Construction activities would also result in the alteration of soil conditions, including the loss of native vegetation and changes in topography and drainage, such that the ability of the site to support native vegetation after construction would be impaired.

Native shrubs and non-native trees or shrubs may also be present at the proposed upper reservoir site that would need to be removed. The loss of individual native and non-native trees or shrubs would usually be an adverse but less-than-significant impact because, individually, they are sufficient enough to support special status wildlife species. However, removal of a non-native tree or shrub containing an active bird (raptor) nest could violate the MBTA and be a potentially significant impact but mitigable to a less-than-significant level with the implementation of PMEs BR-2b, BR-6b, BR-8a, and BR-8b. Likewise, removal of a native tree or shrub containing an active bird (raptor) nest could violate the MBTA and be a potentially significant impact but mitigable to a less-than-significant level.

In addition to those native and non-native trees that would need to be removed, other trees would need to be trimmed to provide appropriate clearances. In the absence of an estimate of the number of trees that would need to be trimmed, for the purpose of this analysis, it was assumed that all trees would need to be removed. Although some percentage of the trees could be retained, pending the development of final construction plan, a precise estimation cannot be provided.

Trimming up to 30 percent of a native tree's crown would diminish the tree's value as wildlife habitat and could cause harm to the tree leading to its decline or death. Therefore, native tree trimming would be significant according to Significance Criterion 1, 2, 4, and 5. The loss (or trimming) of a large number of native trees is a significant impact that would not likely mitigable to a less-than-significant level because adequate mitigation lands required by PME BR-1a for restoration and/or compensation may not be available. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level. PME BR-1a is recommended to reduce the impacts to the greatest extent feasible.

The construction and operation of new transmission lines in areas with high fire risk could contribute to wildfire hazards if they were to reduce the effectiveness or otherwise impede fire-fighting efforts. Fires cause direct loss of vegetation communities, wildlife habitat, and wildlife species. Although periodic fires are part of the natural ecosystem, fires burning too frequently can have significant long-term ecological effects such as degradation of habitat (temporal loss of habitat and non-native plant species invasion) and loss of special status species. The biodiversity of southern California is uniquely adapted to low rainfall, rugged topography, and wildfires. However, fires have become more frequent with growth in the human population, creating a situation in which vegetation communities (and, therefore, habitats for plant and animal species) are changed dramatically and may not recover. This change in vegetation community is called "type conversion" and can occur to any native vegetation community. When burned too frequently, vegetation communities are often taken over by highly flammable, weedy, non-native plant species that burn even more often and provide minimal habitat value for native plant and animal species, especially those of special status. For example, the CGN is dependent primarily on coastal sage scrub vegetation which, if burned too many times, can convert to non-native grassland or disturbed habitat that would preclude its use by the CGN. If the Project were to cause a fire, or inhibit fighting of fires, and this leads to type conversion of sensitive vegetation communities, the impact would likely be significant according to Significance Criteria 1 (Substantial adverse effect through habitat modification on any species identified as candidate, sensitive, or special status) and/or Significance Criteria 2 (Substantial adverse effect on a riparian habitat or other sensitive natural community).

Although future fires may not cause type conversion in all instances, the impact is significant because of the severity of potential habitat loss. This impact is not likely mitigable to a less-than-significant level. From a biological resource perspective, implementation of the vegetation management program described herein would reduce the fire risk, although not to a less-than-significant level.

Impact BR-2: Construction activities would result in adverse effects to jurisdictional waters and wetlands through vegetation removal, placement of fill, erosion, sedimentation, and degradation of water quality. Decker Canyon is a central drainage that supports oak woodland habitat, with several tributary drainages on the upland slopes surrounding it. The proposed Decker Canyon Reservoir site contains approximately 0.51 acres of non-wetland WoUS (under the jurisdiction of the USACE) and 5.84 acres under CDFG jurisdiction. This includes approximately 5.33 acres of riparian canopy that is not under the jurisdiction of USACE. It is likely that the entire area will be impacted during construction. There are no wetlands within the Decker Canyon drainage features. The drainage feature within the proposed reservoir's footprint is about 3,300-feet long and ranges from 1 to 6-feet wide, with an average width of about four feet. Sandy soils typify this site. This stream is ephemeral, likely flowing only during and immediately after flood events. Surveyors observed no vegetation within the active channel. Riparian vegetation outside the ordinary high water mark (OHWM) is dominated by upland species, including chamise, hoary-leafed ceanothus, toyon, and coast live oak. No hydrophytic plants were documented.

Construction activities within Lake Elsinore would impact an additional approximately 3.8 acres of open water that would be jurisdictional.

In accordance with Significance Criteria 3.a (Substantial adverse effect on water quality or wetlands as defined by the USACE and/or CDFG), these impacts are potentially significant but would be mitigable to a less-than-significant level with the implementation of PME BR-2a, in combination with PMEs BR-1g and BR-4.

Construction of the generation (pumped storage) components would cause soil disturbance. Soil disturbance creates conditions that promote the establishment and spread of invasive, non-native plant species and these species may be carried into and out of the area by construction equipment and the importation and exportation of construction materials. This impact is potentially significant but would be mitigable to a less-than-significant level through compliance with FERC/USDA Forest Service requirements and with the implementation of PME BR-3a.

3.3.3.2.2 Project Operation Impacts to Botanical and Vegetation Resources

Impact BR-3: Construction and operation/maintenance activities would result in the introduction of invasive, non-native, or noxious plant species. During Project operation, weed establishment and spread would be a continuing consideration as a result of off-road vehicles on access roads. This activity could cause soil disturbance, introduce more weed seed, and promote the spread of weeds. The introduction and spread of invasive, non-native, or noxious plant species in these areas could be a potentially significant impact but would be mitigable to a less-than-significant level through compliance with FERC/USDA Forest Service requirements and with the implementation of PME BR-3a.

3.3.3.3 Proposed PME Measures to Botanical Resources

Nevada Hydro proposes to consult with agencies and stakeholders with the objective of reaching agreement on new field surveys. These are anticipated to included updated habitat assessments using qualified biologists to conduct reconnaissance-level windshield and/or pedestrian surveys of the proposed project area. The surveys would focus on locations that could provide suitable habitat for sensitive species. They would search for wildlife and sign, and identify areas impacted by wildfire and drought since 2006. Data collected would include detailed mapping and potential habitat for sensitive species. All information would be recorded on standardized datasheets, and Global Positioning Satellite (GPS) data would be collected for vegetation communities and sensitive species. This information would be recorded in a format that can easily be incorporated into environmental documents.

Protocol-Level Surveys

If protocol-level surveys are required to determine the presence or absence of sensitive species, Nevada Hydro proposes to consult with agencies and stakeholders with the objective of reaching agreement on study protocols to perform surveys using qualified biologists deployed in locations that could provide suitable habitat for sensitive species. Data collected would include detailed mapping and potential habitat for sensitive species. All information will be recorded on standardized datasheets as well as GPS locations and boundaries. This information will be presented in a format that can easily incorporated into environmental documents.

Potential habitat for special status plants would be identified during habitat assessment. During the appropriate blooming period, qualified biologists would resurvey areas with potential habitat to detect presence and determine distribution of rare plants within the biological study area. The type and intensity of special status plants surveys would be determined in coordination with state and federal stakeholders.

Table E.3-7: FERC Environmental Measures – Botanical and Wetland Resource PMEs Relating to the Pumped Storage Project

PME	Description
	Federal Energy Regulatory Commission / USDA Forest Service **Final Environmental Impact Statement, Project No. 11858 (January 2007)**
BR-3 (EM-7)	Develop and implement a detailed plan specifying the activities, locations, methods, and schedule that the qualified environmental construction monitor would use to monitor construction activities in terrestrial environments.
BR-4 (EM-8)	Develop and implement a vegetation and invasive weed management plan to prevent and control noxious weeds and exotic plants of concern in project-affected areas during construction and over the term of any license issued for the project.
BR-8 (EM-12)	Prepare a habitat mitigation plan in consultation with the USFS, United States Department of the Interior, CDFG, and Riverside County to identify appropriate mitigation of habitat losses, including a 1:1 replacement ratio for about 5 acres of oak woodlands, about 32 acres of coastal sage scrub, and about 216 acres of chaparral and grasslands.
BR-10 (EM-14)	Develop and implement an annual employee awareness training program regarding special status plants and animals.
	The Nevada Hydro Company - Protection, Mitigation, and Enhancement Measures **Final Environmental Impact Statement, Project No. 11858 (Section 2.3.6)**
BR-12 (PME-2)	Development and implement plans for clearing the upper reservoir area and re-vegetating disturbed areas with native plant species beneficial to wildlife prior to the start of any land-disturbing or land-clearing activities at the project.
BR-13 (PME-3)	Retain a qualified biologist or natural resource specialist to serve as an environmental construction monitor to ensure that incidental construction efforts on biological resources are avoided or limited to the maximum feasible extent.
BR-18 (PME-8)	Conduct wetlands delineation and prepare habitat mitigation and management plans in consultation with the USACE, the CDFG, and the USDA Forest Service.
BR-19 (PME-9)	Develop and implement a plan to prevent and control noxious weeds and exotic plants of concern in project-affected areas.
BR-21 (PME-11)	Consult with the USDA Forest Service and United States Department of the Interior to identify appropriate parcels for mitigation of habitat losses including 2:1 replacement ratio for oak woodlands and 1:1 replacement of coastal sage scrub.
	The Nevada Hydro Company - Supplemental Protection, Mitigation, and Enhancement Measures **Final License Application for Major Unconstructed Project (April 2004)**
BR-23 (PME-A)	Prior to commencement of any grading or site clearance activities affecting jurisdictional waters, the Applicant shall: (1) submit a jurisdictional delineation acceptable to the USACE and CDFG conducted to determine the acreage of areas within the jurisdiction of these two agencies; (2) if deemed required, obtain a Section 404 permit from the USACE and Section 401 water quality certification from the SWRCB; and (3) if deemed required, execute a Streambed Alteration Agreement with the CDFG.
BR-26 (PME-D)	At least 180 days before the start of any land-disturbing or land-clearing activities at the project, the Applicant shall file with FERC, for approval, a plan to revegetate disturbed areas with plant species beneficial to wildlife. The plan shall describe the location of the areas to be revegetated and, at a minimum, shall include: (1) a description of the plant species used and planting densities; (2) fertilization and irrigation requirements; (3) a monitoring program to evaluate the effectiveness of the planting; (4) provisions for the filing of monitoring reports with FERC; (5) a description of procedures to be followed if monitoring reveals that the revegetation is not successful; and (6) an implementation schedule that provides for revegetation as soon as practicable after the beginning of land-clearing or land-disturbing activities with the disturbed area. The Applicant shall

PME	Description
	prepare the plan taking into account fully the erosion, dust, slopes, and sediment control plan prepared pursuant to this license, and after consultation with the appropriate agencies and with any federal agency with managerial authority over any part of project lands. The Applicant shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. FERC reserves the right to require changes to the plan. No land-disturbing activities shall begin until the Applicant is notified, by FERC, that the plan is approved. Upon FERC approval, the Applicant shall implement the plan, including any changes required by the FERC.
BR-27 (PME-E)	At least 180 days before the start of any land-disturbing or land-clearing activities, the Applicant shall file with FERC, for approval, a plan for clearing the reservoir area. The plan, at a minimum, shall include: (1) topographic maps identifying the location and acreage of lands to be cleared; (2) descriptions of the vegetation to be cleared; (3) descriptions of any resource management goals related to fish and wildlife enhancement through vegetative clearing or retention; (4) descriptions of the disposal methodologies and disposal location of unused timber, brush and refuse, and maps identifying the location of disposal sites; and (5) an implementation schedule. The Applicant shall prepare the plan after consultation with the USDA Forest Service. The Applicant shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. The FERC reserves the right to require changes to the plan. No land-disturbing or land-clearing activities shall begin until the Applicant is notified, by FERC, that the plan is approved. Upon FERC approval, the Applicant shall implement the plan, including any changes required by FERC.

Wetland/Waters Delineations

Concurrently with the sensitive plant surveys, qualified wetland specialists would conduct jurisdictional delineations wetland and waters. Wetlands and waters would be delineated in areas where they could be impacted by the project; canyon areas crossed by transmission lines that would not be affected by construction would not be included in the delineation. Wetland determination and delineation surveys would be conducted and reports prepared based on the delineation process for routine determinations as described in the 1987 Corps Wetland Delineation Manual (Environmental Laboratory, 1987) and on the definition used to identify wetlands adopted by the Corps 33 Code of Federal Regulations 323.2(c) in its administration of the Section 404 permit program of the Clean Water Act.

Mapping of wetlands would be conducted using a Trimble GPS unit with sub-meter accuracy, and wetland mapping data and project design plans should be incorporated into a Geographic Information System (GIS) platform to allow for quantification of jurisdictional areas and identification of impact areas. This would allow for the presentation and analysis of information in a format that can be efficiently interpreted by Nevada Hydro and state and federal agencies to facilitate wetlands/waters impacts avoidance, minimization, and/or other mitigation strategies.

3.3.4 Primary Transmission Lines

Biological surveys were conducted from 2001-2006 within all accessible areas proposed for the Project's major elements. Along the primary transmission line route, the survey areas included a minimum 500-foot wide band roughly centered on the proposed transmission alignments. Focused surveys were conducted only in accessible areas that provided suitable habitat as recommended by regulatory agencies including the USDA Forest Service, USFWS, and California Department of Fish and Game (CDFG).

The existing Talega-Escondido 230-kV transmission corridor is located in northern San Diego County. A portion of the corridor is bordered to the north by the National Forest. HELIX mapped the vegetation for the section of 69-kV line which is to be rebuilt between the Pala and Lilac Substations. The remainder of vegetation mapping is from the FEIS and studies conducted by SDG&E (Dudek, 2002).

Most of the Talega-Escondido area is comprised of native scrubs (chaparral and Diegan coastal sage scrub) on steep slopes and disturbed cover types (avocado and citrus groves, cropland, and residential and industrial developed areas). There are small areas of riverine and wetland habitat, grass- and herb-dominated communities, and woodland and forest vegetation. The southern end of the route becomes increasingly urban as it nears the City of Escondido (TNHC, 2007).

Riverine and wetland habitat along the Talega-Escondido transmission line corridor are associated with numerous creeks and rivers, including Cristianitos Creek, San Mateo Creek, and Roblar Creek on Camp Pendleton; the Santa Margarita River along the northeastern portion; and Gomez Creek, San Luis Rey River, and Keys Creek on the Rainbow to Escondido portion (TNHC, 2007).

The approximately 16-mile portion of the Talega-Escondido transmission line located within Camp Pendleton is primarily native scrub (southern mixed chaparral and Diegan coastal sage scrub) along the steep slopes and coast live oak woodland or forest and southern sycamore/alder riparian forest in the valleys and drainages. Approximately three miles of this section is predominated by native grassland interspersed with Engelmann oak woodland. The approximately 22-mile portion of the Talega-Escondido transmission line, from the eastern edge of Camp Pendleton to Pala Road, is predominantly native scrubs interspersed with groves and orchards along the hillsides. The approximately 7.8-mile segment south of Pala Road to the south of Old Castle Road is covered mostly with groves with patches of chaparral and sage scrub, riparian vegetation, and developed areas. The southernmost segment is primarily developed residential, with small patches of native scrub.

The Talega-Escondido transmission line route traverses designated critical habitat for the CGN (between MPs 0-3.5, 21.8-27.8, and 33-36.8), LBV (between MPs 24-24.5 and 34.5-35), and SWF (between MPs 24-24.5 and 34.5-35). A portion of the 69-kV subtransmission line (MPs 34 to 36) occurs within designated critical habitat for the CGN, LBV, and SWF (Dudek, 2002).

The Lake-Santa Rosa segment (MP 0 to MP 12.4) of the gen–tie would cross a variety of vegetation communities; the predominant plant communities are non-native grassland from approximately the I-15 Freeway to the north and northern mixed chaparral from the I-15 Freeway south to MP 12.4. The predominant vegetation communities along the Case Springs-Santa Rosa segment (MP 12.5 to MP 30.6) of the primary transmission line are also northern mixed chaparral and non-native grassland. The primary transmission line facilities (Lake Switchyard, Santa Rosa and Case Springs Substations, access roads, and construction staging areas) would be primarily located in areas supporting predominantly northern mixed chaparral, coastal sage scrub, non-native grassland, and coast live oak woodland.

The proposed Lake-Case Springs 500-kV route would cross nine named drainages. The largest drainage features crossed by the Lake-Case Springs 500-kV primary transmission line include Temescal Creek (a tributary of Santa Ana River) and Los Alamos Creek (a tributary of San Mateo Creek). These vegetation types and the riparian areas located along the creeks provide habitat for a wide range of species and they support, or have the potential to support, a number of special status species.

3.3.4.1 Existing Resources

3.3.4.1.1 Vegetation

For the purpose of this assessment, a 500-foot wide study area, roughly centered on the proposed primary transmission alignment, was examined from 2001-2006. The identified plant communities located within that study area are individually described below and summarized in Table E.3-8.[12] The study area was examined for planning purposes only and is not intended to be equivalent to the Project's potential area of disturbance.

Table E.3-8: Plant Communities – Approximate Acreage in the Study Area

Vegetation Community	Estimated Acreage (acres)		Percentage (%)	
	Applicant1	FERC2	Applicant	FERC
Agriculture	46.3	-	1	-
Chamise Chaparral	3,114.6	3,304	60	39
Coastal Sage Scrub	173.4	173	3	2
Urban/Developed	498.4	500	10	6
Disturbed	375.2	310	7	4
Non-Native Grassland	651.5	819	13	10
Open Water	97.6	3,143	2	37
Coast Live Oak Riparian Forest3	46.1	175	<1	2
Southern Sycamore Adler Riparian Forest3	84.8	84	2	1
Southern Willow Scrub3	25.7	26	<1	<1
Total	5,113.6	8,578	100	100

Notes:

1. Michael Brandman Associates (2004)
2. Federal Energy Regulatory Commission (2007)
3. Identified as a sensitive natural community by the CNDDB

Source: Michael Brandman Associates

Chamise chaparral. Chamise chaparral is a natural plant community that is one of the most prevalent chaparral types in southern California. It is dominated by chamise (*Adenostoma fasciculatum*) and is typically associated with north-facing slopes at lower elevations, although at higher elevations (2,000-feet above msl) it occurs on both north and south-facing slopes. The community is typically found on xeric slopes and ridges with shallow soils and mature stands are usually dense with little herbaceous understory. Typically, the area below the shrub layer is bare ground or a layer of leaf litter. Shrub heights vary from 4 to 8 feet tall.

Chamise chaparral occur throughout most of the proposed 500-kV primary transmission line. In addition to chamise, other common species associated with the community include manzanita (*Arctostaphylus spp.*), laurel sumac (*Molosma laurina*), ceanothus (*Ceanothus spp.*), scrub oak (*Quercus berberidifolia*), toyon (*Heteromeles arbutifolia*), sugar bush (*Rhus ovata*), and mountain mahogany (*Cercocarpus betuloides*). Chamise chaparral occurs off the valley floor at higher elevations (1,500-feet above msl) within the Santa Ana Mountains. There is no chaparral habitat within the Elsinore-Temecula Trough or in the Perris Upland portion of the Project area.

Coastal sage scrub. Coastal sage scrub occurs throughout southern California although it is generally considered sensitive by the regulatory agencies. This community consists of herbaceous plants and woody shrubs from 1-5 feet in height, that form a relatively open canopy. It is generally found in more arid environments than similar shrub communities such as chaparral. Typical vegetation consists of low-

[12]/ Michael Brandman Associates, Final Biological Resource Study – Lake Elsinore Advanced Pumped Storage Project, Riverside County California, August 2003, p. 3-10.

growing shrubs with patches of bare ground beneath the shrubs. It has been incorporated into the California sagebrush series described by Sawyer and Keeler-Wolf.

Coastal sage scrub mainly occurs in the northern portion of the general Project area, north and northwest of Lake Elsinore, and along the base of the foothills of the Santa Ana Mountains. Common species characteristic of this community include California sagebrush (*Artemisia californica*), black sage (*Salvia mellifera*), California buckwheat (*Eriogonum fasciculatum*), white sage (*Salvia apiana*), and California bush sunflower (*Encelia californica*). Coastal sage scrub, as a habitat type, is limited to the northern portion of the Project area, below an elevation limit of approximately 2000-feet above msl.

Non-native grassland. Non-native grassland, a prevalent community throughout California, is characterized by a dense to sparse cover of non-native, annual grasses often associated with numerous weedy species as well as some native annual forbs (wildflowers), especially in years of plentiful rain. Seed germination occurs with the onset of winter rains. Some plant growth occurs in winter, but most growth and flowering occurs in the spring. Plants then die in the summer, and persist as seeds in the uppermost layers of soil until the next rainy season. Dominant plant genera typically found within non-native grasslands include bromes (*Bromus spp.*), wild oats (*Avena spp.*), fescues (*Vulpia spp.*), and barleys (*Hordeum spp.*).

Non-native grassland is the second most dominant vegetation community and is prevalent within three particular areas of the Project's sites. The largest acreage of grassland habitat is located along the Northern (Lake-Santa Rosa) segment of the proposed primary transmission line. The second area is located around Lake Elsinore and is typically associated with existing development and previous disturbance. The third area is located east of Redonda Mesa and Squaw Mountain near the Riverside-San Diego boundary in an area heavily grazed by cattle. Common characteristic species observed included slender oats (*Avena barbata*), red brome (*Bromus rubens*), hare barley (*Hordeum vulgare*), and telegraph weed (*Heterotheca grandiflora*).

Southern coast live oak woodland and riparian forest. Southern coast live oak woodlands and riparian forests are broad-leaved communities dominated by coast live oaks (*Quercus agrifolia*). Woodlands are typically associated with ephemeral drainage features or north-facing slopes in southern California, with riparian forests found in wetter drainages. The communities vary in canopy coverage from closed to partially open and the understory of the community generally contains thick leaf litter with mostly no shrub layer. Evergreen coast live oak trees can reach 30 to 80 feet in height and usually occur on north-facing slopes or south-facing slopes within shaded ravines. The communities are incorporated into the coast live oak series described by Sawyer and Keeler-Wolf.

Southern coast live oak woodlands and riparian forests occur in three main locations. They are present along the Northern (Lake-Santa Rosa) segment of the proposed primary transmission line; within the areas of the upper reservoirs; and along the Southern (Santa Rosa-Case Springs) segment of the proposed primary transmission line east of Redonda Mesa and Squaw Mountain near the Riverside-San Diego boundary, adjacent to non-native grassland habitat. Dominant plant species present include coast live oak and scattered California black walnut trees (*Juglans californica*). The understory is comprised of toyon, laurel sumac, poison oak (*Toxicodendron diversilobum*), and Mexican elderberry (*Sambucus mexicanus*). The herbaceous layer typically contains non-native species, such as ripgut brome (*Bromus diandrus*) and horehound (*Marrubium vulgare*).

Southern sycamore-alder riparian woodland. Southern sycamore-alder riparian woodland occurs throughout drainage courses of southern California that contain available surface and/or sub-surface water flows. This habitat-type is a tall, winter-deciduous riparian community dominated by western sycamore (*Platanus racemosa*) and white alder (*Alnus rhombifolia*). Its canopy is usually open with an understory containing scattered stands of shrubby thickets. Southern sycamore-alder riparian woodland occur in several linear drainage courses at various locations. It occupies small areas along drainages located along the proposed primary transmission alignment. Common species present within the community include western sycamore, alder, mugwort (*Artemisia douglasiana*), California blackberry (*Rubus ursinus*), poison oak, Mexican elderberry, and stinging nettle (*Urtica dioca*).

Southern willow scrub. Southern willow scrub is characterized by dense, broad-leafed, winter-deciduous riparian thickets that are dominated by several species of willows. Scattered emergent Fremont cottonwood (*Populus fremontii*) and western sycamore are also associated within this community. Most stands are too dense to allow understory development. Southern willow scrub is typically found on loose, sandy, or fine gravelly alluvium deposits near stream channels during flood flows. This early seral community type requires repeated flooding to prevent succession to southern cottonwood-sycamore riparian forest. Southern willow scrub is listed as a sensitive plant community by the CDFG. Southern willow scrub occupies a very small portion of the Project area and is specifically associated with a tributary drainage feature located immediately north of Lake Elsinore. Characteristic species within the community include black willow (*Salix goodingii*), arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), and mule fat (*Baccharis salicifolia*).

Agriculture. Agricultural areas are regularly managed or cultivated and are not considered a natural plant community. Vegetation varies depending on agricultural use or crops planted but, generally, agricultural areas contain minimal native vegetation, except common ruderal (weedy) species. In areas that are not actively cultivated and in interstitial or marginal areas, the ground may be frequently disked or simply left fallow. Plant species found in such disturbed areas include telegraph weed, black mustard (*Brassica nigra*) and Russian thistle (*Salsola tragus*). In Riverside County, the Project area contain only one agricultural use, consisting of a 46.3-acre parcel north of Lake Elsinore at the intersection of Riverside Drive and Collier Avenue.

Urban/developed. Urban/developed areas include pavement, concrete, buildings and structures, bridges, and permanent flood control measures. In developed areas, native plant species have been replaced by structures, landscaping, and maintained cleared, open space. Urban/developed areas are mainly found in the vicinity of Lake Elsinore. Landscaped areas are common in suburban residential landscapes and contain ornamental plant species, such as oleander (Nerium oleander) and tree-of-heaven (Ailanthus altissima), that are artificially manicured and irrigated. This type of vegetation provides fragmented low-value habitat for native wildlife species and is subject to noise and disturbance from traffic and other human activities.

Disturbed. Numerous disturbed areas are scattered throughout the Project area and the proposed alignment of the primary transmission line is classified as urban or semi urban.

Each of the identified plant communities are briefly described below.

Southern mixed chaparral. Southern mixed chaparral is dominated by evergreen shrubs with small, sclerophyllous leaves in areas of rocky soil. This association is characterized by a closed spaced canopy and the community is represented by species such as chamise (*Adenostoma fasciculatum*), toyon (*Heteromeles arbutifolia*), white-stem wild lilac (*Ceanothus leucodermis*), sugarbush (*Rhus ovata*), hickleaf wild lilac (*Ceanothus crassifolius*), big-berry Manzanita (*Arctostaphylos glauca*), and scrub oak (*Quercus berberidifolia*).

Diegan coastal sage scrub. Diegan coastal sage scrub is dominated by low, subshrubs that actively grow during the winter and early spring. This community is found on xeric sites with shallow or clay soils. Representative species include California sagebrush (*Artemisia californica*), flat-topped buckwheat (*Eriogonum fasciculatum*), deerweed (*Lotus scoparius*), laurel sumac (*Malosma laurina*), and black sage

(*Salvia mellifera*). Diegan coastal sage scrub is considered a sensitive habitat by the CDFG because it supports a number of federally-listed and State-listed species. [13]

Coast live oak riparian forest. Coast live oak riparian forest is dominated by coast live oak (*Quercus agrifolia*) trees along drainages and stream channels and may also have other tree species as minor components, such as western sycamore (*Platanus racemosa*) and Fremont's cottonwood (*Populus fremontii*).

Southern cottonwood-willow riparian forest. Southern cottonwood-willow riparian forest is an open or closed canopy forest that is generally greater than 20 feet high and occupies relatively broad drainages and flood plains supporting perennially wet streams. This community is dominated by mature individuals of winter deciduous trees, including Fremont's cottonwood and several species of willow (*Salix gooddingii, S. Lasiandra, S. Lasiolepis*), and often has a dense understory of shrubby willows, mule fat, and mugwort (*Artemisia douglasiana*).

Southern sycamore-alder riparian woodland. Southern sycamore-alder riparian woodland is tall, open, broadleafed, winter deciduous streamside woodland dominated by western sycamore and often also by alder (*Alnus rhombifolia*). [14]

Mule fat scrub. Mule fat scrub is found in drainages and streams that are subject to frequent flooding and are dominated by mule fat with lesser amounts of willow species.

Southern willow scrub. Southern willow scrub occurs in areas of dense growth along streams and drainages, dominated by red willow (*Salix laevigata*), arroyo willow (*S. lasiolepis*), narrow-leaved willow (*S. exigua*), black willow (*S. gooddingii*), and mule fat.

Non-native grassland. Non-native grasslands generally occur on fine-textured loam or clay soils which are moist during the winter rainy season and very dry during the summer and fall. Most of the non-native grasslands in the study area appear to be abandoned agricultural land which is now dominated by Avena barbata and Bromus spp. Most of the non-native grassland is bordered by chaparral or sage scrub. It is likely that non-native grassland areas were, at one time, chaparral and scrub and then were cleared for agricultural use in the 20th Century and subsequently abandoned. Native grasslands are considered sensitive by the USFWS and CDFG and are currently very restricted within California, particularly in San Diego and Riverside Counties due to encroachment from development and displacement by exotic species.[15]

Native grasslands. The native grassland occurring within the study area is in the northern portion of Camp Pendleton, near the southern termination of the project. Native grasslands are dominated by perennial bunch-grasses. Valley needlegrass grassland, as described by Holland, is characterized by a relatively low (>10 percent) to dense herbaceous cover of the perennial, tussock-forming species, such as purple needlegrass (*Nasella pulchra*). Native and introduced annuals occur between the needlegrass, often actually exceeding the bunchgrass in cover. This association generally occurs on fine-textured clay soils that are moist or wet in winter but very dry in summer. Shrubs are infrequent, probably due to the unstable clay soils. The degree of habitat quality in native grasslands varies greatly, depending on the history of grazing, cultivation, or other disturbance factors. Annual grasses, a majority of which originated in the Mediterranean region, have replaced nearly all of the native grasslands in California. In addition to purple needlegrass, indicator species include, among others, blue-eyed grass (Sisyrinchium bellum), Mariposa lily, and clarkis (*Clarkis spp.*). Wildlife species typically associated with native grassland include

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[13]/ Op. Cit., Biological Resources Technical Report for the Valley Rainbow Interconnect, pp. 14-15.

[14]/ Ibid., pp. 15-16 and 25.

[15]/ Ibid., pp. 16 and 25.

the grasshopper sparrow (*Ammodramus savannarum*), lark sparrow (*Chondestes grammacus*), and savannah sparrow (*Ammodramus sandwichensis*). Native grasslands with purple needlegrass and foothill needlegrass are considered sensitive by the USFWS and CDFG.

Coast live oak woodland. Coast live oak woodland is an open to dense tree community with coast live oak (*Quercus agrifolia*) the dominant overstory species and Englemenn oak (*Quercus engelmannii*) as an occasional associate. This community can occur on mesic north-facing slopes and in canyon bottoms. This community is well represented in the cismontane, interior valleys, and foothills of the Peninsular Ranges. The scrub understory of this community is poorly developed but may include Mexican elderberry (*Sambucus mexicana*), gooseberry (*Ribes sp*.), poison oak (*Toxicondendrom diversilobum*), and toyon (*Heteromeles arbutifolia*).[16]

Englemann oak woodland. Englemann oak woodland is an oak community that is restricted to the interior of the Peninsular Ranges in the low-lying hills and mesas of western Riverside and San Diego Counties. Open Engelmann oak woodland is dominated by Engelmann oak and occurs on gentler, more arid slopes. Dense Engelmann oak woodland occurs on steeper, more mesic sites in association with coast live oak. The understory of Engelmann oak woodlands can consist of shrub species typical of coastal sage scrub, such as California sagebrush, white sage, and buckwheat. Such an understory generally occurs when this community exists on shallow soils. On deeper soils, the understory is comprised of native and non-native herbaceous species, such as oats (*Avena sp.*), barley (*Hordeum sp.*), and filaree (*Erodium sp.*). Engelmann oak woodland has potential to provide foraging and nesting habitat for several bird species, including Cooper's hawk, acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttallii*), and plain titmouse (*Parus inornatus*), Hutton's vireo (*Vireo huttoni*), western wood pewee (C*ontopus sordidulus*), and scrub jay (*Aphelocoma coerulescens*). This habitat also provides protective cover for species such as the Monterrey salamander (*Ensatina eschscholtzii eschscholtzii)* and raccoon (*Procyon lotor*). Englemann oak woodland is a vegetation community considered to have a high sensitivity rating. The Englemann oak is considered by the CNPS at risk within its range and rare outside of California.[17]

Disturbed, exotic, developed, and unvegetated areas. This category includes all areas which have been disturbed and are not returning to native habitat, including vineyards and orchards, land uses for agriculture, eucalyptus woodlands, ruderal, and urban areas.

Vegetation mapping was conducted by MBA. The upper reservoir site occurs within northern mixed chaparral and coast live oak woodland. The underground penstock system crosses through areas dominated by dense chamise chaparral above 1600 to 1800-feet above mean sea level (msl) with coastal sage scrub habitat below. The proposed Powerhouse and associated facilities would be located primarily within coastal sage scrub. The tailrace tunnel would cross through developed areas, non-native grasslands, and extend into Lake Elsinore. Elevations of proposed facilities range from about 1255-feet above msl at Lake Elsinore to about 2900-feet above msl at the upper reservoir site. This range of elevations supports a wide variety of habitats.

The Project is located, in part, within the National Forest. The Project Area is not located within a designated critical habitat but is linked to the grid across designated critical habitat for the QCB and CGN. QCB critical habitat occurs north of the I-15 Freeway. CGN critical habitat occurs west of the proposed transmission line.

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[16]/ Ibid., pp. 17-20.

[17]/ Ibid., pp. 19-20; Op. Cit., Valley-Rainbow Interconnect Proponent's Environmental Assessment, pp. 4-124-126.

3.3.4.1.2 Wetlands and Other Waters

Jurisdictional waters and wetlands were surveyed by MBA at the Decker Canyon Reservoir site during October 2007 (MBA, 2007). Two main drainages and several tributaries occur at the Decker Canyon Reservoir site and construction staging areas and two main drainages and four swales occur at the Project Powerhouse site. Lake Elsinore is a jurisdictional water body.

Open water. Open water areas include Lake Elsinore and Lee (Corona) Lake to the west of the primary transmission line. These areas are typically inundated with water year round and do not contain any surface vegetation. Although not a vegetation community, open water is a natural habitat for many fish and waterfowl, as well as a year-round source of water for other wildlife species. The edges of open water areas vary from unvegetated banks to shores containing species typical of riparian or freshwater marsh communities, such as willow (*Salix spp.*) and cattail (*Typha spp.*).

Jurisdictional waters and wetlands. In addition to the Temescal Wash, there are smaller, tributary drainages that may qualify as either "waters of the United States" (WoUS) or "waters of the State" (WoS). The largest drainage features within the Project area include Temescal Creek (a tributary of Santa Ana River). Many of the small drainage features appear to be ephemeral (flows only during and for short periods after storm events) as indicated by the lack of hydrophytic vegetation (plant species that depend on periodic saturation). The large drainage courses that conduct intermittent flows for extended periods (>3-4 days) after storms are typically dry during the late summer months in years with average to below average rainfall. These larger drainage courses contain either coast live oak woodlands/riparian forests or sycamore-alder riparian woodlands. Virtually all the drainage features in the Project area are expected to fall under USACE and CDFG jurisdiction where a defined channel bed and banks are observable.

The estimated jurisdictional acreage for WoUS and WoS found within the Project area is presented in Table E.3-9.

Table E.3-9: Estimated Jurisdictional Acreage

Project Facility	Waters of the United States (acres)	Waters of the State (acres)
Decker Canyon Upper Reservoir	0.8	4.4
Santa Rosa Substation/ Powerhouse	0.1	0.4

Disturbed wetlands are communities dominated by exotic wetland species. These species have invaded sites that had been previously disturbed or are periodically disturbed. This perturbation regime has resulted in the displacement of native wetland species and the subsequent colonization of these areas by exotics. Disturbed wetlands can be dominated by giant reed (*Arnundo donax*), tamarisk (*Tamarix spp.*), and cocklebur (*Xanthium strumarium var. canadense*), but native species such as mule map, willows, or cattails may also be present.

3.3.4.2 Potential Impacts to Existing Botanical and Vegetation Resources

Because the potential biological resource impacts of certain improvements and upgrades would be negligible, a number of improvements and upgrades proposed to existing components of the SCE system are not individually addressed herein. Those improvements and upgrades include those that are: (1) limited to the area within the existing "fence line" of those SCE facilities and not result in a substantive physical change to the nature of the existing land use; (2) which will be placed on existing or new wooden subtransmission poles within the existing roadway and/or utility rights-of-way within existing urban areas and already including subtransmission facilities; and (3) those which will be placed underground and involve limited or negligible surface disturbance.

3.3.4.2.1 Construction Impacts to Botanical and Vegetation Resources

Impact BR-1: Construction activities would result in temporary and permanent losses of native vegetation. As depicted in Table E.3-6, construction of the primary connection would cause both temporary (during construction from vegetation clearing) and permanent (displacement of vegetation with facilities such as towers, underground lines and substation) impacts to existing vegetation communities. Construction activities would also result in the alteration of soil conditions, including the loss of native seeds and changes in topography and drainage, such that the ability of a site to support native vegetation after construction may be impaired.

Construction activities would also result in the alteration of soil conditions, including the loss of native seeds and changes in topography and drainage, such that the ability of a site to support native vegetation after construction may be impaired.

Impact BR-1: Project construction would result in temporary and permanent losses of native vegetation

In accordance with Significance Criteria 2.a (Substantial adverse effect on a riparian habitat or other sensitive natural community by temporarily or permanently removing it during construction, grading, clearing, or other activities), impacts to sensitive vegetation communities could be significant and not likely be mitigable to a less-than-significant level because adequate mitigation lands may not be available to compensate for the impacts. If off-setting compensatory resources could be identified and if applicable resource agencies, this impact could be reduced to a less-than-significant level.

PME BR-1a is recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to sensitive vegetation communities.

The loss of native trees and shrubs could be a significant impact if that loss were to result in: (1) Substantial adverse effect on candidate, sensitive, or special status species (Significance Criteria 1); (2) Substantial adverse effect on riparian habitat or other sensitive natural community (Significance Criteria 2); (3) Substantial adverse effect on federally protected water quality or wetlands (Significance Criteria 3); (4) Interfere with wildlife movement or the use of native wildlife nursery sites (Significance Criteria 4); and/or (5) Conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (Significance Criteria 5).

Impact BR-2: Construction activities would result in adverse effects to jurisdictional waters and wetlands through vegetation removal, placement of fill, erosion, sedimentation, and degradation of water quality. The primary transmission line would cross one named drainage. A number of drainage features crossed by the primary transmission line could qualify as either WoUS (under the jurisdiction of the USACE) and/or WoS (under the jurisdiction of the CDFG). The largest drainage feature crossed by the primary transmission line area is Temescal Wash (a tributary of Santa Ana River). A few small drainage features appear to be ephemeral, as indicated by the lack of hydrophytic vegetation (TNHC, 2007) and, therefore, do not contain perennial flows that could support fish and other species that are dependent on permanent water sources.

Jurisdictional waters and wetlands were surveyed at the primary connection during October 2007 (MBA, 2007).

Any impacts would be mitigable to a less-than-significant level with the implementation of PMEs BR-2a, BR-2b, and BR-2c, in combination with the implementation of PMEs BR-1f, BR-1g, and BR-4.

Impact BR-2: Construction activities would result in adverse effects to jurisdictional waters and wetlands through vegetation removal, placement of fill, erosion, sedimentation, and degradation of water quality.

In accordance with Significance Criteria 3.a (Substantial adverse effect on water quality or wetlands as defined by the USACE and/or CDFG) and/or Significance Criteria 3.b (If the Applicant were to fail to provide an adequate buffer to protect the function and values of existing wetlands), impacts to jurisdictional areas could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-2a, BR-2c, and BR-2c, in combination with PMES BR-1f, BR-1g, and BR-4.

Impact BR-3: Construction and operation/maintenance activities would result in the introduction of invasive, non-native, or noxious plant species. A variety of invasive, non-native plant species are known to occur in the primary transmission line study area. These include red brome, black mustard, castor bean, tree tobacco, Russian thistle, yellow sweet clover, bristly ox-tongue, yellow-star thistle, and giant reed.

Construction of the primary transmission line would cause soil disturbance which creates conditions that promote the establishment and spread of invasive, non-native plant species. These species may be carried into and out of the area by construction equipment or in fill material. In addition, during primary connection operation, weed establishment and spread would be a continuing consideration as a result of off-road vehicles on access roads. This activity could cause soil disturbance, introduce more weed seed, and promote the spread of weeds. The introduction and spread of invasive, non-native, or noxious plant species in these areas could be potentially significant but would be mitigable to less-than-significant level with the implementation of PME BR-3.

Impact BR-4: Construction activities would create dust that may result in degradation of vegetation. Construction activities, such as grading, underground transmission line construction, pole footing excavation, and driving of equipment on unpaved roadways, would result in increased levels of dust that may settle on surrounding vegetation. Increased levels of dust can significantly impact plants' photosynthetic capabilities and degrade the overall vegetation community. This impact is potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-4 and AQ-1a.

Impact BR-5: Construction activities would result in direct or indirect loss of listed or sensitive plants or a direct loss of habitat for listed or sensitive plants. An impact to special status plant species is significant and not likely mitigable to a less-than-significant level according to Significance Criteria 1.a (Any impact to one or more individuals of a species that is federal or State listed as endangered or threatened) and/or Significance Criteria 1.b (Any impact that would affect the number or range or regional long-term survival of a sensitive or special status plant species). If off-setting compensatory resources could be identified and if that compensation were accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

Although the resulting impact is likely to remain significant, PMEs BR-5a through BR-5d, in combination with PMEs BR-1a, BR-1c, BR-1d, and BR-1f, and are recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to special status plant species.

Impacts to sensitive vegetation communities would be significant according to Significance Criteria 2.a (Substantial adverse effect on a riparian habitat or other sensitive natural community by temporarily or permanently removing it during construction, grading, clearing, or other activities). This impact is assumed to not be mitigable to a less-than-significant level because it is unknown if enough suitable mitigation lands are available to compensate for the impacts. If off-setting compensatory resources could be identified and if that compensation were accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level with mitigation.

3.3.4.2.2 Project Operation Impacts to Botanical and Vegetation Resources

Table E.3-10: Biological Resource PMEs

PME Number	Description
BR-1a	Maintenance and monitoring shall be conducted following a prescribed schedule to assess progress and identify potential problems with the restoration. Remedial action (e.g., additional planting, weeding, erosion control, use of container stock, supplemental watering, etc.) shall be taken by an experienced, qualified Habitat Restoration Contractor during the maintenance and monitoring period if necessary to ensure the success of the restoration. If the restoration fails to meet the established success criteria after the maintenance and monitoring period, maintenance and monitoring shall extend beyond the five-year period until the criteria are met or unless otherwise approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). For areas where habitat restoration cannot meet mitigation requirements, off-site purchase and dedication of habitat shall be provided as required by the USDA Forest Service or other agencies with jurisdiction over the project. Tree Mitigation. Mitigation for loss of native trees or native tree trimming shall be provided by (1) acquiring and preserving habitat within which the trees occur and/or (2) restoring (i.e., planting) trees on land that would not be subject to vegetation clearing (either in the Applicant's ROW and/or on land acquired and preserved). Any land to be used for this mitigation shall be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). For habitat acquisition and preservation on non-federal lands in San Diego County, the mitigation ratios shall be specified in the final EIR. Non-federal lands in Riverside County will be addressed under the requirements of the Riverside County MSHCP and minimization efforts will be completed. Loss of coast live oak trees (that occur in coast live oak woodland) shall require mitigation at a 1:1 ratio based on the permanent impact to the summed acreage of all individual coast live oak trees impacted. Therefore, if the total acreage of all individual coast live oak trees in coast live oak woodland impacted is 10 acres, then 10 acres of coast live oak woodland shall be acquired and preserved. For all trimmed native trees, the trees shall be monitored for a period of three years. If a trimmed tree declines or suffers mortality during that period, the tree shall be replaced in-kind (by species) at a 2:1 ratio. If a tree does not decline or suffer mortality, no mitigation shall be required. Where applicable, the loss of habitat would be compensated for in a mitigation fee that would be used to purchase lands under the authority of the Riverside Conservation Agency (RCA) as a part of the Riverside County MSHCP requirements. USDA Forest Service lands and any other federal lands will require a habitat mitigation plan that meets USDA Forest Service habitat objectives and standards and provide additional enhancement measures to offset unavoidable effects that are determined by the USDA Forest Service to be inconsistent with the applicable Land Management Plan. All restoration shall be maintained and monitored for a minimum of 5 years. The restoration shall be directed according to a Habitat Restoration Plan approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project. Mitigation Parcels/Habitat Management Plans. All off-site mitigation parcels shall be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) and must be acquired or their acquisition must be assured before the primary transmission line is energized. To demonstrate that such parcels shall be acquired, the Applicant shall submit a Habitat Acquisition Plan at least 120 days prior to any ground disturbing activities. The plan shall be submitted to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) for review and approval and shall include, but shall not necessarily be limited to, legal descriptions and maps of all parcels proposed for acquisition, schedule that includes phasing relative to impacts, timing of conservation easement recordation (if applicable), initiation of habitat management activities relative to acquisition, and assurance mechanisms (e.g., performance bonds or other instruments to assure adequate funding) for compensatory lands not acquired prior to vegetation disturbance activities. Fees associated with the Riverside County MSHCP (if applicable) must be deposited prior to any vegetation disturbing activities, although the exact lands to be purchased or enhanced would be

PME Number	Description
	under the direction of the RCA. A Habitat Management Plan shall be prepared by a biologist approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project for all acquired off-site mitigation parcels. The Habitat Management Plan must be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project prior to the initiation of any vegetation disturbing activities. The Applicant shall work with the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) until a plan is approved. The Habitat Management Plan shall provide direction for the preservation and responsible management of all acquired, off-site mitigation parcels. The Habitat Management Plan shall include, but shall not be limited to: [1] Legal descriptions of all mitigation parcels approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project. [b] Baseline biological data for all mitigation parcels. [3] Designation of a land management entity approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to provide responsible management. [4] A Property Analysis Record prepared by the designated land management entity that explains the amount of funding reasonably required to implement the Habitat Management Plan. [5] Designation of responsible parties and their roles (e.g., provision of endowment by the Applicant to fund the Habitat Management Plan and implementation of the Habitat Management Plan by the designated land management entity). [6] Management specifications including, but not limited to, appropriate biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project.
BR-1b	Conduct biological monitoring. Monitoring shall be provided by a qualified biologist approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to ensure that all impacts occur within designated limits. Monitoring entails communicating with contractors, taking daily notes, and ensuring that the requirements of the PMEs and mitigation measures are being met by being present during construction activities including all initial grubbing and clearing of vegetation. Additionally, a qualified biologist employed by the Applicant shall be present during maintenance involving right-of-way repair requiring ground disturbance (i.e., scouring). Biological monitoring of these maintenance activities is to prevent impacts to vegetation communities or wildlife habitat not within the permanent project impact footprint or to record and report unauthorized impacts outside the footprint to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to ensure the unauthorized impacts are mitigated in accordance with PME BR-1a. The qualified biologist shall conduct monitoring for any area subject to disturbance from construction and the maintenance activities (or access roads used during maintenance activities in the case of vernal pools/water-holding basins; see PME BR-1b). The qualified biologist shall perform periodic inspections of construction once or twice per week, as defined by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable), depending on the sensitivity of the identified resources and the Applicant's construction schedule. The qualified biologist shall send weekly monitoring reports to the CPUC and shall record any reduction or increase in construction impacts so that consideration can be given to revising established mitigation requirements. The final impact/mitigation calculations shall be submitted to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) for review and approval. The qualified biologist shall send annual monitoring reports of maintenance activities to the CPUC, USDA Forest Service (on NFS lands), and to other agencies with jurisdiction over the project (as applicable) that describe the types of maintenance that occurred, at what locations they occurred, and whether or not there were unauthorized impacts requiring mitigation. The Applicant, its contractors and subcontractors, and their respective project personnel, shall refer all known environmental issues, including wildlife relocation, sick or dead wildlife, hazardous waste, or questions about environmental impacts to the qualified biologist. Where applicable, experts in wildlife handling may need to be brought in by the qualified biologist for assistance with wildlife relocations. The qualified biologist shall have the authority to issue stop work orders if any relevant part of the permit conditions are being violated. The qualified biologist shall immediately notify the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) of

PME Number	Description
	any significant events, including impacts outside the construction zone or maintenance impacts outside the authorized permanent impact footprint if they are discovered during the construction or monitoring of maintenance activities. Reinitiating work following a stop work order shall only occur when the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project are satisfied that the impacts have been fully documented, that compensation for these impacts shall be made, and that any additional protection measures they deem necessary shall be undertaken.
BR-1c	Perform protocol surveys. The Applicant would perform any detailed on-the-ground protocol surveys, with regard to specific sensitive plants or wildlife species whose habitat would be impacted by the project based on final design, in accordance with State or federal regulations or statutes. Where applicable, the Applicant shall submit the results of these surveys to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) and consult on reasonable and feasible mitigation measures for potential impacts, prior to any ground disturbing activities in a particular area. Mitigation shall prioritize, but not be limited to, avoidance as the primary means to address impacts. If avoidance is not feasible, then relocation/restoration should be implemented. Where relocation/restoration is not feasible or deemed not to fully address impacts, then mitigation through on- or off-site purchase or dedication of habitat at the approved ratios and locations shall be identified and implemented.
BR-1d	Train project personnel. Prior to construction, all the Applicant's contractors, subcontractors and project personnel shall receive training regarding the appropriate work practices necessary to effectively implement the adopted biological measures and conditions and to comply with the applicable environmental laws and regulations, including appropriate wildlife avoidance and impact minimization procedures, the importance of these resources and the purpose and necessity of protecting them; and methods for protecting sensitive ecological resources.
BR-1e	Construction and survey activities shall be restricted based on final design engineering drawings. The area limits of project construction and survey activities shall be predetermined based on the temporary and permanent disturbance areas noted on the final design engineering drawings, with activity reasonably restricted to and confined within those limits. Survey personnel shall keep survey vehicles on existing roads or approved access roads. During project surveying activities, brush clearing for footpaths, line-of-sight cutting, and land surveying panel point placement in sensitive habitat shall require prior approval from the Biological Resource Monitor in conformance with the PMEs. Hiking off roads or paths for survey data collection is allowed year-round as long as other PMEs are met. Stringing of new wire and reconductoring for the project would be allowed year-round in sensitive habitats if the conductor is not allowed to drag on the ground or in brush, where sensitive resources are present, and all vehicles used during stringing remain on project access roads or approved staging areas. Where stringing requires that conductor drop within brush of drag on or through the brush or ground or vehicles leave project access roads, where required by the Biological Resource Monitor, the Applicant shall, at a minimum, perform a site survey, as appropriate, to determine presence or absence of endangered nesting birds or other endangered or sensitive species in the work area. Where applicable, the Applicant would submit results of surveys to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) and consult on reasonable and feasible mitigation measures for potential impacts, prior to dropping wire in brush, dragging wire on the ground or through brush, or taking vehicles off project access roads and staging areas. However, these surveys would not replace the need for the Applicant to perform detailed on-the-ground surveys as otherwise required by PME BR-1c. No paint or permanent discoloring agents shall be applied to rocks or vegetation to indicate limits of survey or construction activity where any sensitive biological resources or wildlife habitats are encountered in the field.
BR-1f	Build access roads at right angles to streambeds and washes. To the extent feasible, access roads shall be built at right angles to the streambeds and washes. Where it is not feasible for access roads to cross at right angles, where feasible, the Applicant shall limit roads constructed parallel to streambeds or washes to a maximum length of 500 feet at any one primary 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

PME Number	Description
	constructed parallel to streambeds would require review and approval of necessary permits from the United States Army Corps of Engineers (USACE), California Department of Fish and Game (CDFG), applicable California Regional Water Quality Control Board (RWQCB), and/or State Water Resources Control Board (SWRCB). Culverts shall be installed where needed for right angle crossings, but rock crossings may be utilized across most right angle drainage crossings. All construction and maintenance activities shall be conducted in a manner that would minimize disturbance to vegetation, drainage channels and stream banks (e.g., structures would not be located within a stream channel and construction activities would avoid sensitive features). Prior to construction in streambeds and washes, the Applicant shall, at a minimum, perform a pre-activity survey to determine the presence or absence of endangered riparian species. These surveys would not replace the need for the Applicant to perform detailed on-the-ground surveys as otherwise required by PME BR-1c.
BR-1g	Comply with all applicable environmental laws and regulations. In the construction, operation, and maintenance of the project, the Applicant would comply with all applicable environmental laws and regulations, including, without limitation, those regulating and protecting wildlife and its habitat.
BR-1h	Where feasible in proximity to potential nesting sites, every effort shall be made to avoid constructing roads during the nesting season. When it is not feasible to keep vehicles on existing or authorized access roads or to avoid constructing new access roads during the nesting, breeding, or flight season, the Applicant shall, at a minimum, perform site surveys in those areas where work is to occur. These surveys shall be performed to determine presence or absence of endangered nesting birds or other endangered or protected species in the work area. When applicable, the Applicant shall submit survey results to the USFWS and CDFG and consult on reasonable mitigation measures to avoid or minimize potential impacts prior to vehicle use off existing access roads or the construction of new access roads. These surveys shall not replace the need for the Applicant to perform detailed on-the-ground surveys otherwise required by PME BR-1c. Except where authorized, parking or driving underneath oak trees is not allowed in order to protect root structures. In addition to regular watering to control fugitive dust created during clearing, grading, earth-moving, excavation, and other construction activities which could interfere with plant photosynthesis, a 15 mile-per-hour speed limit shall be observed on dirt access roads to reduce dust and allow reptiles and small mammals to disperse. Except where authorized, all new access roads or spur roads constructed as part of the project that are not required as permanent access for future project maintenance and operation shall be permanently closed. Where required, roads shall be permanently closed using the most effective feasible and least environmentally damaging methods appropriate to that area (e.g., stockpiling and replacing topsoil or rock replacement) with the concurrence of the underlying landowner and the governmental agency having jurisdiction. This would limit new or improved accessibility into the area. Mowing or trampling of vegetation can be an effective method for protecting the vegetative understory while at the same time creating access to the work area. Mowing or trampling may be used when permanent access is not required or where grades exceed a 15 percent slope since, with time, total re-vegetation can be expected. If mowing or trampling is in response to a permanent access need, but the alternative of grading is undesirable because of downstream siltation potential or scaring, periodic mowing may be necessary and allowable to maintain permanent access. The project Biological Resource Monitor shall conduct checks on mowing/trampling procedures to ensure that mowing/trampling for temporary or permanent access roads is limited to a 14-foot-wide area on straight portions of the road and a 16- to 20-foot-wide area at turns and that the mowing height is no less than 4 inches from finished grade.
BR-2a	The mitigation of habitat shall be maintained and monitored for five years after installation or until established success criteria (specified percent cover of native and non-native species, species diversity, and species composition as compared with an undisturbed reference site) are met, to assess progress and identify potential problems with the mitigation. Remedial action (e.g., additional planting, weeding, erosion control, use of container stock, supplemental watering) shall be taken during the maintenance and monitoring period if necessary to ensure the success of the mitigation. If the mitigation fails to meet the established performance criteria after the five-year maintenance and monitoring period, maintenance and monitoring shall extend beyond the five-year period until the criteria are met or unless otherwise approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable).

PME Number	Description
	A Habitat Management Plan shall be prepared by a biologist approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) for all acquired off-site mitigation parcels. The Habitat Management Plan must be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) prior to the initiation of any activities which may impact jurisdictional areas. The Applicant shall work with the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) until a plan is approved. The Habitat Management Plan shall provide direction for the preservation and responsible management of all acquired, off-site mitigation parcels. The Habitat Management Plan shall include, but shall not be limited to: [1] Legal descriptions of all acquired or assured (as defined in PME BR-1a). [2] Baseline biological data for all mitigation parcels. [3] Designation of a land management entity approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project to provide responsible management. [4] A Property Analysis Record prepared by the designated land management entity that explains the amount of funding reasonably required for the implementation of the Habitat Management Plan. [5] Designation of responsible parties and their roles. [6] Management specifications including, but not limited to, appropriate biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and [7] submission of annual reports to CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project.
BR-2b	Identify environmentally sensitive times and locations for tree trimming. Environmentally sensitive tree trimming locations for the project shall be identified in the Applicant's vegetation management tree trim database to be utilized by tree trim contractors. The Biological Resource Monitor shall be contacted prior to trimming in environmentally sensitive areas. Whenever feasible, trees in environmentally sensitive areas, such as areas of riparian or native scrub vegetation, shall be scheduled for trimming during non-sensitive (i.e., outside breeding or nesting) times. Where trees cannot be trimmed during non-sensitive times, the Applicant would, at a minimum, perform site surveys to determine presence or absence of endangered nesting bird species in riparian or native scrub vegetation. When applicable, the Applicant shall submit the results of these surveys to the USFWS and CDFG and consult on mitigation measures for potential impacts, prior to tree trimming in environmentally sensitive areas. However, these surveys shall not replace the need for the Applicant to perform detailed on-the-ground surveys as otherwise required by PME BR-1c. Where riparian areas with over-story vegetation are crossed, where feasible, tree removal (i.e., clear-cut) widths would be varied to minimize visual landscape contrast and to maintain habitat diversity at established wildlife corridor edges. Where applicable, when tree removal widths cannot be varied, the Applicant shall consult with the USFWS and CDFG to develop alternative tree removal options that could reasonably maintain edge diversity. Avoid sensitive features. In areas designated as sensitive by the Biological Resource Monitor or the resource agencies, to the extent feasible, structures and access roads shall be designed to minimize impacts to sensitive features (sensitive features include, but are not limited to, high-value wildlife habitats, sensitive vegetation communities, and high-value plant habitats) and/or to allow conductors to clearly span the features, within limits of standard structure design. If the sensitive features cannot be completely avoided, structures and access roads shall 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, the Applicant shall perform site surveys to determine presence or absence of endangered species in sensitive habitats.
BR-2c	Where applicable, the Applicant shall submit the results of these surveys to the USFWS and consult on mitigation measures for potential impacts, prior to constructing structures or access roads. These surveys shall not replace the need for the Applicant to perform detailed on-the-ground surveys as otherwise required by PME BR-1c. Where it is not feasible for access roads to avoid sensitive water resource features, such as streambed crossings, to the extent feasible, such crossings shall be built at right angles to the streambeds. Where such crossings cannot be made at right angles, where feasible, roads constructed parallel to streambeds shall be limited to a maximum length of 500 feet at any one primary transmission line crossing location. Such parallel roads shall be constructed in a manner that minimizes potential adverse impacts on "waters of the U.S." Streambed crossings or roads constructed parallel to streambeds shall require review and approval of necessary permits from the USACE, CDFG, RWQCB, and/or SWRCB.

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BR-3	In addition, vehicles, tools, and equipment shall be washed at an off-site washing facility if those vehicles, tools, and equipment have been used in an area where invasive plants have been mapped during the pre-construction weed control inventory and as directed by the Biological Resource Monitor, prior to entering a project area free of populations of invasive plants (as determined by the pre-construction weed control inventory). Vehicles, tools, and equipment used for maintenance shall be washed at an off-site washing facility immediately before each maintenance event. All washing shall take place where rinse water is collected and disposed of in either a sanitary sewer or landfill. An effort shall be made to use wash facilities that use recycled water. A written daily log shall be kept for all vehicle/equipment/tool washing that states the date, time, location, type of equipment washed, methods used, and staff present. The log shall include the signature of a responsible staff member. Logs shall be available to the CPUC, USDA Forest Service (on NFS lands), other agencies with jurisdiction over the project (as applicable), and Biological Resource Monitor for inspection at any time and shall be submitted to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction (as applicable) over the project on a monthly basis during construction and submitted annually to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) during operation/maintenance.
BR-4	Erosion Control Plan. An Erosion Control Plan shall also be developed for application in both USDA Forest Service and non-USDA Forest Service lands. The plan shall include measures to control erosion, stream sedimentation, dust, and soil mass movement attributable to the project. The plan shall be based on actual-site geological, soil, and groundwater conditions and shall include: (1) a description of the actual site conditions; (2) detailed descriptions, design drawings, and specific topographic locations of all control measures; (3) measures to divert runoff away from disturbed land surfaces; (4) measures to collect and filter runoff over disturbed land surfaces, including sediment ponds at the diversion and powerhouse sites; (5) revegetating disturbed areas in accordance with current direction on use of native plants and locality of plant and seed sources; (6) measures to dissipate energy and prevent erosion; and (7) a monitoring and maintenance schedule.
BR-5a	Impacts to moderately sensitive plant species (i.e., USDA Forest Service Sensitive and CNPS List 1 and 2 species) shall be avoided where feasible. Where not feasible, impacts shall be compensated through reseeding (with locally collected seed stock) or relocation to temporarily disturbed areas (reseeding and relocation of plants in the CNF shall be determined by the USDA Forest Service). Avoidance may not be feasible due to physical or safety constraints. PME BR-1a would also provide habitat-based mitigation for these impacts. Where reseeding or salvage and relocation is required, the Applicant shall identify a qualified Habitat Restoration Specialist (HRS) to be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). The HRS shall prepare and implement a Restoration Plan for reseeding or salvaging and relocating special status plant species to be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) prior to impacting the plant resources. The Applicant shall work with the above-listed agencies until a plan is approved. The reseeding or relocation of plants shall be maintained and monitored for five years after installation, or until established success criteria are met, to assess progress and identify potential problems with the mitigation. Remedial action (e.g., additional seeding, weeding, erosion control, use of container stock, supplemental watering) shall be taken during the maintenance and monitoring period if necessary to ensure the success of the restoration. If the restoration fails to meet the established performance criteria after the 5-year maintenance and monitoring period, maintenance and monitoring shall extend beyond the 5-year period until the criteria are met or unless otherwise approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). A Habitat Management Plan for any required, off-site mitigation shall be prepared by a biologist approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). The Habitat Management Plan must be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) prior to the initiation of any activities which may impact special status plant resources. The Applicant shall work with the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) until a plan is approved. The Habitat Management Plan shall provide direction for the preservation and responsible management of all acquired off-site mitigation

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	parcels. The Habitat Management Plan shall include, but shall not be limited to: [1] Legal descriptions of all acquired or assured (as defined in PME BR-1a) off-site mitigation parcels approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). [2] Baseline biological data for all mitigation parcels. [3] Designation of a land management entity approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to provide responsible management. [4] A Property Analysis Record prepared by the designated land management entity that explains the amount of funding reasonably required to implement the Habitat Management Plan. [5] Designation of responsible parties and their roles. [6] Management specifications including, but not limited to, appropriate biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable).
BR-5b	Conduct biological monitoring. Prior to construction, plant population boundaries designated as sensitive by USFWS or CDFG and other resources designated sensitive by the Applicant and resource agencies shall be clearly delineated with clearly visible flagging or fencing, which shall remain in place for the duration of construction. Flagged areas would be avoided to the extent practicable during construction activities in that area. Where these areas cannot be avoided, focused surveys for covered plant species shall be performed in conformance with PME BR-1c. The responsible resource agencies shall be consulted for appropriate mitigation and/or revegetation measures prior to disturbance. Notification of presence of any covered plant species to be removed in the work area shall occur not less than 10 work days prior to project activity, during which time the USFWS or CDFG may remove such plants or recommend measures to minimize or reduce the take. If neither USFWS nor CDFG has removed such plants within 10 work days following written notice, the Applicant may proceed with work and cause a take of such plants.
BR-5c	No collection of plants or wildlife. Plant or wildlife species may not be collected for pets or any other reason.
BR-5d	Salvage sensitive species for replanting or transplanting. Species identified as sensitive by the land managing agency shall be salvaged, where feasible, and where avoidance is not feasible in accordance with State law. Generally, salvage may include removal and stockpiling for replanting on site, removal and transplanting out of surface disturbance area, removal and salvage by private individuals, and removal and salvage by commercial dealers, or any combination of the above.
BR-6a	Littering is not allowed. Littering is not allowed. Other than in designated containers, project personnel shall not deposit or leave any food or waste in the project area and no biodegradable or non-biodegradable debris shall remain in the right-of-way following completion of construction.
BR-6b	Survey areas for brush clearing. Brush clearing around any project facility (e.g., structures, substations, switchyards) for fire protection, visual inspection or project surveying, in areas which have been previously cleared or maintained within a two-year or shorter period shall not require a pre-activity survey. In areas not cleared or maintained within a two-year period, brush clearing shall not be conducted during the breeding season (January 15 through August 15) without a pre-activity survey for vegetation containing active nests, burrows, or dens. Pre-activity survey shall make sure that the vegetation to be cleared contains no active migratory bird nests, burrows, or active dens prior to clearing. If occupied migratory bird nests are present, unless otherwise directed by fire personnel, fire protection or visual inspection brush clearing work shall be avoided until after the nesting season or until the nest becomes inactive. If no nests are observed, clearing may proceed. Where burrows or dens are identified in the reconnaissance-level survey, soil in the brush clearing area should be sufficiently dry before clearing activities occur to prevent mechanical damage to burrows that may be present.
BR-6c	Protect mammals and reptiles in excavated areas. Where feasible, construction holes shall not be left open and uncovered over night. Covers shall be secured in place nightly prior to workers leaving the site and shall be strong enough to prevent livestock or wildlife from falling through and into a hole. Holes and/or trenches shall be inspected prior to filling to ensure absence of mammals and reptiles. Where consistent with requirements to minimize disturbance, excavations shall be sloped on one end to provide an escape route for small mammals and reptiles.

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BR-6d	Reduce construction night lighting on sensitive habitats. Reduce construction night lighting on sensitive habitats. Exterior lighting within the project area adjacent to preserved habitat shall be of the lowest illumination allowed for human safety, consistent with the intent of such lighting, selectively placed, shielded, and directed away from preserved habitat to the maximum extent practicable. After nightfall, vehicle traffic associated with project activities shall be kept to a minimum volume and speed to prevent mortality of nocturnal wildlife species.
BR-6e	Cover all steep-walled trenches or excavations during construction to prevent wildlife entrapment. Where feasible, steep-walled trenches or excavations used during construction shall be covered except when being actively utilized. If the trenches or excavations cannot be covered, exclusion fencing (i.e., silt fencing) shall be installed around the trench or excavation or it shall be covered to prevent entrapment of wildlife. Open trenches or other excavations that could entrap wildlife shall be inspected by the Biological Resource Monitor a minimum of two times per day and immediately before backfilling. Employees and contractors shall look under vehicles and equipment for the presence of wildlife before movement. If wildlife is observed, no vehicles or equipment would be moved until the animal has left voluntarily or is removed by the qualified biologist. Should a dead or injured listed species be found in a trench or excavation or anywhere in the construction zone or along an access road, the Biological Resource Monitor shall contact the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) within 48 hours of the finding. The Biological Resource Monitor shall report the species found, its location, the cause of death (if known), and document pertinent information.
BR-7a	Mitigation for the loss of LBV- or SWF-occupied habitat on non-federal lands in San Diego County (or designated critical habitat for the SWF) shall be implemented as follows; [1] Permanent impacts to occupied habitat and/or designated critical habitat shall include off-site acquisition and preservation of occupied habitat or designated critical habitat at a 2:1 ratio. [2] Temporary impacts to occupied habitat or designated critical habitat shall include 1:1 on-site restoration and 1:1 off-site acquisition and preservation of occupied habitat and/or designated critical habitat. Unless otherwise authorized by the USFWS, impacts to LBV or SWF critical habitat must be mitigated within the same Critical Habitat Unit where the impact occurred. Mitigation for the loss of LBV- or SWF-occupied habitat on non-federal lands in Riverside County under the Riverside County MSHCP (or designated critical habitat for the SWF) shall be implemented as follows: If the Applicant seeks compliance with the Riverside County MSHCP, on lands under the jurisdiction of the Riverside County MSHCP, permanent impacts to more than 10 percent of occupied habitat and/or designated critical habitat will require a DBESP or equivalent. If the loss is the least environmentally damaging alternative, the impacts to occupied habitat or designated critical habitat shall include 1:1 on-site restoration. If a USFWS protocol, pre-construction survey, conducted in an area where presence of the LBV or SWF was assumed determines that the species is absent, mitigation obligations shall be reduced accordingly or eliminated. Any acquired habitat shall be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). A Habitat Management Plan for any required, off-site mitigation shall be prepared by a biologist approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). The Habitat Management Plan must be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) prior to the initiation of any activities which may directly or indirectly impact the LBV or SWF or its habitat. The Applicant shall work with the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) until a plan is approved. The Habitat Management Plan shall provide direction for the preservation and responsible management of all acquired LBV or SWF habitat. The Habitat Management Plan shall include, but shall not be limited to: [1] Legal descriptions of all acquired or assured (as defined in PME BR-1a) LBV or SWF habitat approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). [2] Baseline biological data for all LBV or SWF habitat. [3] Designation of a land management entity approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to provide responsible management. [4] A Property Analysis Record prepared by the designated land management entity that explains the amount of funding reasonably required to implement the Habitat Management Plan. [5] Designation of responsible parties and their roles. [6] Management specifications including, but not limited to,

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	appropriate biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable).
BR-7b	Implement appropriate avoidance/minimization strategies for eagle nests. Except as otherwise authorized hereunder, no construction or maintenance activities shall occur within 1,320 feet of an eagle nest during the eagle breeding season (December through June). No construction shall take place within this buffer until the nest is no longer active unless there are physical or safety constraints. If construction must take place within the buffer, a qualified acoustician shall monitor noise as construction approaches the edge of the occupied habitat, as directed by a USFWS-permitted biologist. If the noise meets or exceeds the 60 dB(A) Leq threshold or if the biologist determines that the activities in general are disturbing the nesting activities, the biologist shall have the authority to halt or redirect construction and shall consult with resource agencies to devise methods to reduce the noise and/or disturbance. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nesting birds and the activities, and/or working in other areas until the young have fledged. The USFWS-permitted biologist shall monitor the nest daily until activities are no longer within 1,320 feet of the nest or the fledglings become independent of their nest.
BR-7c	Conduct Quino checkerspot butterfly surveys and implement appropriate avoidance/minimization/ compensation strategies. A USFWS-permitted biologist shall determine suitable habitat areas (i.e., non-excluded areas per the 2002 USFWS protocol) within any designated USFWS Quino checkerspot butterfly (QCB) survey area that would be impacted by project construction. A pre-construction, USFWS protocol presence/absence survey for the adult QCB shall be conducted within all suitable habitat for this species in the construction zone within any designated USFWS QCB survey area. The survey shall be conducted in a year where the QCB is readily observed at USFWS QCB-monitored reference sites to determine what areas are occupied by the QCB (i.e., any suitable habitat within 1 kilometer of a current QCB sighting is considered occupied) and what areas are not occupied. The USFWS-permitted biologist shall record the precise locations of QCB larval host plants within the construction zone (and 10 meters beyond) using GPS technology. If the protocol pre-construction survey is conclusive for determining absence of the QCB, then areas without QBC would not require mitigation. If the protocol pre-construction survey is not conclusive for determining QCB absence (for example, as a result of limited detectability per the 2002 protocol) or if a survey is not conducted, then all suitable habitat areas shall be considered potentially occupied and require mitigation as follows. On non-federal lands in San Diego County, if construction occurs outside the larvae and adult activity season (June 1 through October 15) and stays at least 10 meters away from all host plant locations, then no mitigation is required. If construction occurs between October 16 and May 31 or within 10 meters of host plant locations or within designated critical habitat, then [a] temporary impacts to the habitat shall be mitigated through on-site restoration of temporarily disturbed areas and off-site acquisition and preservation of an equal sized area of QCB-occupied habitat at a 2:1 mitigation ratio and [b] permanent impacts shall be mitigated through off-site acquisition and preservation of QCB-occupied habitat (or QCB-designated critical habitat for impacts to designated critical habitat) at a 2:1 mitigation ratio. Any acquired habitat shall be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). A USFWS-permitted biologist shall be present during all construction activities in potentially occupied habitat to monitor and assist the construction crews to ensure impacts occur only as allowed. This same mitigation shall apply where the protocol pre-construction survey was conclusive for determining that the QCB is present and where construction would occur in designated critical habitat. Unless otherwise authorized by the USFWS, impacts to QCB critical habitat must be mitigated within the same Critical Habitat Unit where the impacts occurred. If host plant mapping is not possible during the pre-construction survey (e.g., drought prevents plant germination), then all suitable habitat (i.e., non-excluded habitat per the 2002 protocol) shall be considered occupied by the QCB and mitigated under the assumption that the QCB is present. A Habitat Management Plan for any required, off-site mitigation shall be prepared by a biologist approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over

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	the project (as applicable). The Habitat Management Plan must be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) prior to the initiation of any activities which may directly or indirectly impact QCB or its habitat. The Applicant shall work with the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) until a plan is approved. The Habitat Management Plan shall provide direction for the preservation and responsible management of all acquired QCB habitat. The Habitat Management Plan shall include, but shall not be limited to: [1] Legal descriptions of all acquired or assured (as defined in PME BR-1a) QCB habitat approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). [2] Baseline biological data for all QCB habitat. [3] Designation of a land management entity approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to provide responsible management. [4] A Property Analysis Record prepared by the designated land management entity that explains the amount of funding reasonably required to implement the Habitat Management Plan. [5] Designation of responsible parties and their roles. [6] Management specifications including, but not limited to, appropriate biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable).
BR-7d	Where feasible, the removal of arroyo toad riparian breeding habitat shall occur from October through December to minimize potential impacts to breeding adults (including potential sedimentation impacts to toad eggs) and dispersing juveniles. Where the toad is present (or assumed to be present if no pre-construction survey is conducted), the construction zone shall be fenced with exclusion fencing to prevent toad access to it. The fencing shall be a silt-screen type barrier comprised of a minimum 24-inch high fence with the remainder (minimum 12 inches) anchored firmly against the ground. The fence may be buried if necessary to exclude toad access. The fence locations shall be identified by a USFWS-permitted biologist and adjusted as necessary. Exclusion fencing shall be monitored daily by a qualified biologist (see PME BR-1b) and maintained in its original condition by construction personnel for the length of the construction period in arroyo toad habitat. Pre- and post-exclusion fencing surveys within the construction zone shall be conducted for arroyo toads by a biologist permitted by the USFWS to handle the toad. Prior to construction commencement, a minimum of three surveys shall be conducted by the biologist following installation of the fencing and prior to construction activities. One of these clearance surveys must take place no more than 24 hours prior to activity commencement. These surveys shall be conducted during appropriate climatic conditions and during the appropriate time of day or night to maximize the likelihood of encountering arroyo toads. If conditions are not appropriate for arroyo toad movement during surveys, the biologist may attempt to elicit a response from the toads during nights (i.e., at least one hour after sunset), provided that temperatures are above 50°F, by spraying the project area with water to simulate a rain event. After the three clearance surveys outlined above have been completed, daily surveys shall be conducted each morning prior to the continuation of construction activity. Any toads found shall be relocated to appropriate similar habitat outside project impact areas. Mitigation for the loss of arroyo toad-occupied habitat on non-federal lands in San Diego County shall be implemented as follows. Permanent impacts to occupied, arroyo toad breeding habitat shall include off-site acquisition and preservation of occupied arroyo toad breeding habitat at a 3:1 ratio. Permanent impacts to occupied, upland burrowing habitat shall include off-site acquisition and preservation of occupied, upland burrowing habitat at a 2:1 ratio. Temporary impacts to occupied breeding habitat shall include 1:1 on-site restoration and 2:1 off-site acquisition and preservation of occupied breeding habitat. Temporary impacts to occupied, upland burrowing habitat shall include 1:1 on-site restoration and 1:1 off-site acquisition and preservation of occupied, upland burrowing habitat. Any acquired arroyo toad habitat shall be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). Mitigation for the loss of arroyo toad or arroyo toad habitat on non-federal lands in Riverside County under the Riverside County MSHCP (or designated critical habitat for the toad) shall be implemented as follows. Permanent impacts to more than 10 percent to occupied habitat and/or designated critical habitat shall require a DBESP, or equivalent. If the loss is the least environmentally damaging

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	alternative, the impacts to occupied habitat or designated critical habitat shall include 1:1 restoration. A Habitat Management Plan for any required, off-site mitigation shall be prepared by a biologist approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). The Habitat Management Plan must be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) prior to the initiation of any activities which may directly or indirectly impact arroyo toad or its habitat. The Applicant shall work with the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) until a plan is approved. The Habitat Management Plan shall provide direction for the preservation and responsible management of all acquired arroyo toad habitat. The Habitat Management Plan shall include, but shall not be limited to: [1] Legal descriptions of all acquired or assured (as defined in PME BR-1a) arroyo toad habitat approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). [2] Baseline biological data for all arroyo toad habitat. [3] Designation of a land management entity approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to provide responsible management. [4] A Property Analysis Record prepared by the designated land management entity that explains the amount of funding reasonably required to implement the Habitat Management Plan. [5] Designation of responsible parties and their roles. [6] Management specifications including, but not limited to, appropriate biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable).
BR-7e	Conduct Stephens' kangaroo rat surveys, and implement appropriate avoidance/minimization/compensation strategies. A pre-construction, USFWS protocol survey shall be conducted for the SKR by a USFWS-permitted biologist in the construction zone where absence of the species has not been proven to conclusively define the impacts to occupied habitat. In the absence of this survey data on non-federal lands in San Diego County, the mitigation acreages required below shall stand. Where the pre-construction survey determines the species is absent, mitigation obligations shall be reduced accordingly or eliminate. Where the SKR is present (or if no pre-construction survey is conducted and the SKR is assumed to be present), prior to vegetation clearing or other ground-disturbing activities, the construction zone shall be fenced to provide a barrier that excludes the SKR from the construction zone and delineates the active work area. A USFWS-permitted biologist shall be present when the fence is installed to minimize habitat disturbance. The fence shall be constructed of ¼-inch gauge hardware cloth backed by silt fencing or other material if approved by the USFWS. No gaps greater than 0.5 inches shall be allowed within the exclusion fencing. The qualified biologist (see PME BR-1b) or other designated personnel shall check the fencing at the end of each work day. If gaps greater than 0.5-inch are detected, they shall be promptly repaired. The exclusion fencing shall remain in place and be maintained without gaps until project construction is completed in SKR suitable habitat. Any pipes stored on the ground during construction shall be capped prior to the end of each work day to prevent SKR from entering the pipes. Immediately preceding vegetation clearing or other ground-disturbing activities within the fenced areas, live-trapping of the SKR shall be conducted by the USFWS-permitted biologist for a minimum of five nights. Trapping locations shall be selected at the discretion of the biologist in coordination with the USFWS. Trapped animals shall be released outside the fenced area in appropriate habitat. Results of the trapping effort shall be provided to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) within 24 hours of trapping completion. Mitigation for the loss of occupied SKR habitat shall be implemented as follows: [1] Permanent impacts to occupied habitat shall include off-site acquisition and preservation of occupied habitat at a 2:1 ratio. [2] Temporary impacts to occupied habitat shall include 1:1 on-site restoration and 1:1 off-site acquisition and preservation of occupied habitat. [3] Payment of applicable fees (see PME BR-7f). Any acquired SKR habitat shall be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). A Habitat Management Plan for any required, off-site mitigation shall be prepared by a biologist approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over

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	the project (as applicable). The Habitat Management Plan must be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) prior to the initiation of any activities which may directly or indirectly impact the SKR or its habitat. The Applicant shall work with the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) until a plan is approved. The Habitat Management Plan shall provide direction for the preservation and responsible management of all acquired SKR habitat. The Habitat Management Plan shall include, but shall not be limited to: [1] Legal descriptions of all acquired or assured (as defined in PME BR-1a) SKR habitat approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). [2] Baseline biological data for all SKR habitat. [3] Designation of a land management entity approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to provide responsible management. [4] A Property Analysis Record prepared by the designated land management entity that explains the amount of funding reasonably required to implement the Habitat Management Plan. [5] Designation of responsible parties and their roles. [6] Management specifications including, but not limited to, appropriate biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). In Riverside County, the project shall be implemented in a manner consistent with the Habitat Conservation Plan of the Stephens' Kangaroo Rat (SKR) in Western Riverside County. In compensation for direct and indirect impacts associated with ground-disturbing activities undertaken in the SKR Core Reserve Area, the Applicant shall acquire property containing suitable habitat and subject to the following criteria: (1) compensatory acreage, off-setting physically disturbed acreage in the Core Reserve Area, shall be on a minimum 1:1 basis with no net loss of occupied habitat, based on the actual area of disturbance to be determined prior to the initiation of construction; (2) to the extent feasible, the Applicant will work with the USFWS' Carlsbad Office to find off-setting property or properties in, contiguous with, or directly adjacent to the boundaries of the Lake Mathews-Estelle Mountain Core Reserve Area; (3) the off-setting property or properties shall be occupied by SKR or shall contain suitable habitat for that species; (4) the property shall be maintained for conservation purposes by the Riverside County Habitat Conservation Agency; and (5) the adequacy of the selected property to offset impacts to SKR Core Reserve is subject to written concurrence of the USFWS. If off-setting properties cannot be located in or adjacent to the Lake Mathews-Estelle Mountain Core Reserve Area, the Applicant will work with the USFWS to identify other areas for mitigation. Implementation, as agreed to by the USFWS, shall occur prior to commencement of project-related ground-disturbing activities within the Core Reserve Area.
BR-7f	Pay the Stephens' kangaroo rat fee assessment per the current Riverside County rate. For impacts to SKR habitat in Riverside County, the Applicant shall provide funding for impacts to the SKR Fee Assessment Area.
BR-7g	The Habitat Management Plan shall include, but shall not be limited to: [1] Legal descriptions of all acquired or assured (as defined in PME BR-1a) CGN habitat approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). [2] Baseline biological data for all CGN habitat. [3] Designation of a land management entity approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to provide responsible management. [4] A Property Analysis Record prepared by the designated land management entity that explains the amount of funding reasonably required to implement the Habitat Management Plan. [5] Designation of responsible parties and their roles. [6] Management specifications including, but not limited to, appropriate biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). The Applicant shall provide compensation for the permanent loss of gnatcatcher critical habitat at a ratio of 2:1 through acquisition and preservation of gnatcatcher critical habitat or other habitat acceptable to USFWS. The Applicant shall also provide on-site restoration of all and temporary loss disturbance of critical habitat at a ratio of 1:1. The mitigation shall include off-site purchase and preservation of CGN critical habitat or other habitat acceptable to USFWS. The remainder of the mitigation shall be implemented as is applicable.

PME Number	Description
BR-7h	The restoration of vernal pool habitat shall include the salvage of vernal pool/water-holding basin soils that would be impacted and that likely contain federally listed fairy shrimp cysts and are free of common vernal pool weed species. The salvaged soils shall be used in the restoration of vernal pool habitat. The restored vernal pool habitat shall be maintained and monitored for five years after installation or until established success criteria identified in the mitigation plan (e.g., specified percent cover of native and non-native species, species diversity, and species composition as compared with undisturbed reference pools) are met. If the mitigation fails to meet the established success criteria after the five-year maintenance and monitoring period, maintenance and monitoring shall extend beyond the five-year period until the criteria are met or unless otherwise approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). A Habitat Management Plan shall be prepared by a biologist approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) for all vernal pool habitat restoration areas. The Habitat Management Plan must be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) prior to the initiation of any activities which may directly or indirectly impact vernal pools or water-holding basins. The Applicant shall work with the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) until a plan is approved. The Habitat Management Plan shall provide direction for the preservation and responsible management of all vernal pool habitat restoration areas. The Habitat Management Plan shall include, but shall not be limited to: [1] Legal descriptions of all restoration areas approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). [2] Baseline biological data for all restoration areas. [3] Designation of a land management entity approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to provide responsible management. [4] A Property Analysis Record prepared by the designated land management entity that explains the amount of funding reasonably required to implement the Habitat Management Plan. [5] Designation of responsible parties and their roles. [6] Management specifications including, but not limited to, appropriate biological surveys to compare with baseline exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reports to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable).
BR-8a	Conduct pre-construction surveys and monitoring for breeding birds. To the extent feasible, all vegetation clearing, except tree trimming or removal, shall take place between August 16 and January 14 (i.e., outside of the general avian breeding season of January 15 through September 15). Tree removal or trimming shall take place between September 16 and December 31 (i.e., outside the raptor breeding season of January 1 through August 15). If project construction (not vegetation clearing or tree trimming/removal) cannot occur outside the general avian breeding season, then pre-construction surveys for bird species' nests shall be conducted by a qualified biologist within 300 feet of the construction zone within 10 calendar days prior to the initiation of construction that would occur between January 15 and September 15. The results of the survey shall be submitted to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) prior to initiating any construction activities. If project construction (not vegetation clearing or tree trimming/removal) cannot occur completely outside the raptor breeding season, then pre-construction surveys for active raptor nests shall be conducted by a qualified biologist within 500 feet of the construction zone no more than seven days prior to the initiation of construction that would occur between January 1 and September 15. If no active nests are observed, construction may proceed. If active nests are found, work may proceed provided that construction activity is (1) located at least 500 feet from raptor nests, (2) located at least 160 to 250 feet from occupied burrowing owl burrows, (3) located at least 300 feet from listed bird species nests, and (4) located at least 100 feet from non-listed bird species nests; and (5) noise levels do not exceed 60 dB(A)hourly Leq at the edge of nesting territories as determined by a qualified biologist in coordination with a qualified acoustician. There may be a reduction of these buffer zones depending on site-specific conditions or the existing ambient level of activity. The Applicant shall contact the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) to determine the appropriate buffer zone. In the case of raptors (except the burrowing owl), the noise level restriction stated above does not apply. Otherwise, if the noise meets or exceeds the 60 dB(A) Leq threshold or if the biologist

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	determines that the construction activities are disturbing nesting activities, the biologist shall have the authority to halt or redirect the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area or other reasonable actions authorized by the qualified biologist (see PME BR-1b) until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. The qualified biologist shall be responsible for documenting the results of the surveys and the ongoing monitoring and for reporting these results to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable).
BR-8b	Removal of raptor nests. Prior to construction, the Applicant shall remove all existing inactive raptor nests from structures that would be affected by project construction. Removal of nests shall occur outside the raptor breeding season (January to July). If it is necessary to remove an existing raptor nest during the breeding season, a qualified biologist shall survey the nest prior to removal to determine if the nest is active. A nest would be considered active if it contains eggs or fledglings. If the nest does not contain eggs or nestlings and is inactive, it shall be removed promptly. If a nest is determined to be active, the nest shall not be removed and the qualified biologist (see PME BR-1b) shall monitor the nest to ensure nesting activities/breeding activities are not disrupted. If the biological monitor determines that project activities are disturbing or disrupting nesting activities, the monitor shall make feasible recommendations to reduce the noise and/or disturbance in the vicinity of the nest.
BR-9a	Permanently close access roads along the primary transmission alignment, except where authorized. On federal lands, monitor and manage road closures to assure there is no unauthorized public access to prevent an increase in disturbance to mountain lions and to prevent the introduction and spread of non-native plant species.
BR-9b	Survey for bat nursery colonies. A CDFG-approved biologist shall conduct a habitat assessment for bat nursery colonies prior to any construction activity. Based on the findings of the habitat assessment, if suitable habitat is present, the approved biologist shall conduct a survey for bat nursery colonies or signs of such colonies prior to construction. Direct impacts to a nursery colony site shall not be allowed and approach of or entrance to an active nursery colony site shall be prohibited. Before any blasting or drilling in the vicinity of a nursery colony site, the CDFG-approved biologist shall work with the construction crew to devise and implement methods to minimize potential indirect impacts to the nursery colony site from falling rock or substantial vibration (while a nursery colony is active). The methods shall include an option to halt or redirect construction activity that would cause falling rock, substantial vibration impacts, or any other construction-related impact (including lighting used for night work) to a nursery colony as determined by the approved biologist, until the colony is inactive. Should falling rock block the entrance to a nursery colony site, the contractor shall work with the approved biologist to re-open an entrance to the site.
BR-10	Utilize collision-reducing techniques in installation of primary transmission lines. The Applicant shall install the transmission lines utilizing Avian Power Line Interaction Committee (APLIC) standards for collision-reducing techniques, as outlined in “Mitigating Bird Collisions with Power Lines: The State of the Art in 1994” (APLIC, 1994). Placement of towers and lines shall not be located above existing towers and lines, topographic features, or tree lines to the maximum extent practicable. Power lines should be clustered in the vertical and horizontal planes aligned with existing geographic features or tree lines, and located parallel (rather than perpendicular) to prevailing wind patterns to the maximum degree feasible. Overhead lines that are located in highly utilized avian flight paths shall be marked utilizing fixed mount Firefly Flapper/Diverters, swan flight diverter coils, or other diversion devices, if proven more effective, as to be visible to birds and to reduce possible avian collision with power lines. The Applicant shall implement an avian reporting system for documenting bird mortalities to help identify problem areas. The reporting system shall follow the format in Appendix C of “Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006” (APLIC, 2006) or a similar format. The Applicant shall submit a draft Reporting Protocol and Reporting System to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project for review

PME Number	Description
	and approval (as applicable). The Applicant shall continue to work with these agencies until approval of a final reporting protocol and reporting system is obtained from the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). The Applicant shall develop and implement methods to reduce mortalities in identified problem areas. The methods shall be approved by the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable). Bird mortality shall continue to be documented in the problem areas per the avian reporting system to determine the effectiveness of the mortality reduction methods and to determine if new methods need to be developed. Area requiring markers for the include those locations where the transmission line would cross Temescal Wash near Lee Lake, Cow Canyon, Horsethief Canyon, McVicker Canyon, Leach Canyon, Los Alamos Canyon, and Tenaja, and San Mateo Creeks.
BR-12	Other maintenance activities shall occur outside the general avian breeding season where feasible. For other maintenance activities that cannot occur outside the above-listed breeding seasons, a qualified biologist (see PME RB-1b) shall work with a qualified acoustician to determine if a maintenance activity would meet or exceed the 60 dB(A) Leq hourly noise threshold where nesting territories of the CGN, LBV, SWF, and burrowing owl occur. If the noise threshold would not be met or exceeded at the edge of their nesting territories, then maintenance activities may proceed. If the noise threshold would be met or exceeded at the edge of their nesting territories, pre-maintenance surveys for nests of these species shall be conducted by a qualified biologist (USFWS-permitted biologist for CGN, LBV, and SWF) within 300 feet of the maintenance area no more than seven days prior to initiation of maintenance that would occur between February 15 and August 30 for the CGN, March 15 and September 15 for the LBV, April 15 and September 15 for the SWF, and February 1 and August 31 for the burrowing owl. If active nests are found, work may proceed provided that methods, determined by the qualified acoustician to be effective, are implemented to reduce noise below the threshold. These methods include, but are not limited to, turning off vehicle engines and other equipment whenever possible and/or installing a protective noise barrier between a nesting territory and maintenance activities. If the qualified acoustician determines that no methods would reduce noise to below the threshold, maintenance shall be deferred until the nestlings have fledged as determined the qualified biologist. Where noise-reducing methods are employed, active nests shall be monitored by the qualified biologist on a weekly basis until maintenance is complete or until the nestlings fledge, whichever comes first. The qualified biologist shall be responsible for documenting the results of the pre-maintenance nest surveys and the nest monitoring and for reporting these results to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable).

3.3.4.3 Proposed PME Measures

The Applicant proposes to consult with agencies and stakeholders with the objective of reaching agreement on any additional field surveys. These are anticipated to included updated habitat assessments using qualified biologists to conduct reconnaissance-level windshield and/or pedestrian surveys of the proposed project area. Any surveys would search for wildlife and sign, and identify areas impacted by wildfire and drought since 2006. Data collected would include detailed mapping and potential habitat for sensitive species. All information would be recorded on standardized datasheets, and Global Positioning Satellite (GPS) data would be collected for vegetation communities and sensitive species. This information would be recorded in a format that can easily be incorporated into environmental documents.

Protocol-Level Surveys

If protocol-level surveys are required to determine the presence or absence of sensitive species, the Applicant proposes to consult with agencies and stakeholders with the objective of reaching agreement on study protocols to perform surveys using qualified biologists deployed in locations that could provide suitable habitat for sensitive species. Data collected would include detailed mapping and potential habitat for sensitive species. All information will be recorded on standardized datasheets as well as GPS locations and boundaries. This information will be presented in a format that can easily incorporated into environmental documents.

Potential habitat for special status plants would be identified during habitat assessment. During the appropriate blooming period, qualified biologists would resurvey areas with potential habitat to detect presence and determine distribution of rare plants within the biological study area. The type and intensity of special status plants surveys would be determined in coordination with state and federal stakeholders.

Table E.3-11: FERC Environmental Measures – Botanical and Wetland Resource Impacts Relating to the Pumped Storage Project

Measure	Description
	Federal Energy Regulatory Commission / USDA Forest Service **Final Environmental Impact Statement, Project No. 11858 (January 2007)**
BR-3 (EM-7)	Develop and implement a detailed plan specifying the activities, locations, methods, and schedule that the qualified environmental construction monitor would use to monitor construction activities in terrestrial environments.
BR-4 (EM-8)	Develop and implement a vegetation and invasive weed management plan to prevent and control noxious weeds and exotic plants of concern in project-affected areas during construction and over the term of any license issued for the project.
BR-8 (EM-12)	Prepare a habitat mitigation plan in consultation with the USFS, United States Department of the Interior, CDFG, and Riverside County to identify appropriate mitigation of habitat losses, including a 1:1 replacement ratio for about 5 acres of oak woodlands, about 32 acres of coastal sage scrub, and about 216 acres of chaparral and grasslands.
BR-10 (EM-14)	Develop and implement an annual employee awareness training program regarding special status plants and animals.
	The Nevada Hydro Company - Protection, Mitigation, and Enhancement Measures **Final Environmental Impact Statement, Project No. 11858 (Section 2.3.6)**
BR-12 (PME-2)	Development and implement plans for clearing the upper reservoir area and re-vegetating disturbed areas with native plant species beneficial to wildlife prior to the start of any land-disturbing or land-clearing activities at the project.
BR-13 (PME-3)	Retain a qualified biologist or natural resource specialist to serve as an environmental construction monitor to ensure that incidental construction efforts on biological resources are avoided or limited to the maximum feasible extent.
BR-18 (PME-8)	Conduct wetlands delineation and prepare habitat mitigation and management plans in consultation with the USACE, the CDFG, and the USDA Forest Service.
BR-19 (PME-9)	Develop and implement a plan to prevent and control noxious weeds and exotic plants of concern in project-affected areas.
BR-21 (PME-11)	Consult with the USDA Forest Service and United States Department of the Interior to identify appropriate parcels for mitigation of habitat losses including 2:1 replacement ratio for oak woodlands and 1:1 replacement of coastal sage scrub.
	The Nevada Hydro Company - Supplemental Protection, Mitigation, and Enhancement Measures **Final License Application for Major Unconstructed Project (April 2004)**
BR-23 (PME-A)	Prior to commencement of any grading or site clearance activities affecting jurisdictional waters, the Applicant shall: (1) submit a jurisdictional delineation acceptable to the USACE and CDFG conducted to determine the acreage of areas within the jurisdiction of these two agencies; (2) if deemed required, obtain a Section 404 permit from the USACE and Section 401 water quality certification from the SWRCB; and (3) if deemed required, execute a Streambed Alteration Agreement with the CDFG.
BR-26 (PME-D)	At least 180 days before the start of any land-disturbing or land-clearing activities at the project, the Applicant shall file with FERC, for approval, a plan to revegetate disturbed areas with plant species beneficial to wildlife. The plan shall describe the location of the areas to be revegetated and, at a minimum, shall include: (1) a description of the plant species used and planting densities; (2) fertilization and irrigation requirements; (3) a monitoring program to evaluate the effectiveness of the planting; (4) provisions for the filing of monitoring reports with FERC; (5) a description of procedures to be followed if monitoring reveals

Measure	Description
	that the revegetation is not successful; and (6) an implementation schedule that provides for revegetation as soon as practicable after the beginning of land-clearing or land-disturbing activities with the disturbed area. The Applicant shall prepare the plan taking into account fully the erosion, dust, slopes, and sediment control plan prepared pursuant to this license, and after consultation with the appropriate agencies and with any federal agency with managerial authority over any part of project lands. The Applicant shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. FERC reserves the right to require changes to the plan. No land-disturbing activities shall begin until the Applicant is notified, by FERC, that the plan is approved. Upon FERC approval, the Applicant shall implement the plan, including any changes required by the FERC.
BR-27 (PME-E)	At least 180 days before the start of any land-disturbing or land-clearing activities, the Applicant shall file with FERC, for approval, a plan for clearing the reservoir area. The plan, at a minimum, shall include: (1) topographic maps identifying the location and acreage of lands to be cleared; (2) descriptions of the vegetation to be cleared; (3) descriptions of any resource management goals related to fish and wildlife enhancement through vegetative clearing or retention; (4) descriptions of the disposal methodologies and disposal location of unused timber, brush and refuse, and maps identifying the location of disposal sites; and (5) an implementation schedule. The Applicant shall prepare the plan after consultation with the USDA Forest Service. The Applicant shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. The FERC reserves the right to require changes to the plan. No land-disturbing or land-clearing activities shall begin until the Applicant is notified, by FERC, that the plan is approved. Upon FERC approval, the Applicant shall implement the plan, including any changes required by FERC.
	Federal Energy Regulatory Commission / USDA Forest Service **Final Environmental Impact Statement, Project No. 11858 (January 2007)**
BR-3 (EM-7)	Develop and implement a detailed plan specifying the activities, locations, methods, and schedule that the qualified environmental construction monitor would use to monitor construction activities in terrestrial environments.
BR-4 (EM-8)	Develop and implement a vegetation and invasive weed management plan to prevent and control noxious weeds and exotic plants of concern in project-affected areas during construction and over the term of any license issued for the project.
BR-8 (EM-12)	Prepare a habitat mitigation plan in consultation with the USFS, United States Department of the Interior, CDFG, and Riverside County to identify appropriate mitigation of habitat losses, including a 1:1 replacement ratio for about 5 acres of oak woodlands, about 32 acres of coastal sage scrub, and about 216 acres of chaparral and grasslands.
BR-10 (EM-14)	Develop and implement an annual employee awareness training program regarding special status plants and animals.
	The Nevada Hydro Company - Protection, Mitigation, and Enhancement Measures **Final Environmental Impact Statement, Project No. 11858 (Section 2.3.6)**
BR-12 (PME-2)	Development and implement plans for clearing the upper reservoir area and re-vegetating disturbed areas with native plant species beneficial to wildlife prior to the start of any land-disturbing or land-clearing activities at the project.
BR-13 (PME-3)	Retain a qualified biologist or natural resource specialist to serve as an environmental construction monitor to ensure that incidental construction efforts on biological resources are avoided or limited to the maximum feasible extent.

Measure	Description
BR-18 (PME-8)	Conduct wetlands delineation and prepare habitat mitigation and management plans in consultation with the USACE, the CDFG, and the USDA Forest Service.
BR-19 (PME-9)	Develop and implement a plan to prevent and control noxious weeds and exotic plants of concern in project-affected areas.
BR-21 (PME-11)	Consult with the USDA Forest Service and United States Department of the Interior to identify appropriate parcels for mitigation of habitat losses including 2:1 replacement ratio for oak woodlands and 1:1 replacement of coastal sage scrub.
	The Nevada Hydro Company - Supplemental Protection, Mitigation, and Enhancement Measures Final License Application for Major Unconstructed Project (April 2004)
BR-23 (PME-A)	Prior to commencement of any grading or site clearance activities affecting jurisdictional waters, the Applicant shall: (1) submit a jurisdictional delineation acceptable to the USACE and CDFG conducted to determine the acreage of areas within the jurisdiction of these two agencies; (2) if deemed required, obtain a Section 404 permit from the USACE and Section 401 water quality certification from the SWRCB; and (3) if deemed required, execute a Streambed Alteration Agreement with the CDFG.
BR-26 (PME-D)	At least 180 days before the start of any land-disturbing or land-clearing activities at the project, the Applicant shall file with FERC, for approval, a plan to revegetate disturbed areas with plant species beneficial to wildlife. The plan shall describe the location of the areas to be revegetated and, at a minimum, shall include: (1) a description of the plant species used and planting densities; (2) fertilization and irrigation requirements; (3) a monitoring program to evaluate the effectiveness of the planting; (4) provisions for the filing of monitoring reports with FERC; (5) a description of procedures to be followed if monitoring reveals that the revegetation is not successful; and (6) an implementation schedule that provides for revegetation as soon as practicable after the beginning of land-clearing or land-disturbing activities with the disturbed area. The Applicant shall prepare the plan taking into account fully the erosion, dust, slopes, and sediment control plan prepared pursuant to this license, and after consultation with the appropriate agencies and with any federal agency with managerial authority over any part of project lands. The Applicant shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. FERC reserves the right to require changes to the plan. No land-disturbing activities shall begin until the Applicant is notified, by FERC, that the plan is approved. Upon FERC approval, the Applicant shall implement the plan, including any changes required by the FERC.
BR-27 (PME-E)	At least 180 days before the start of any land-disturbing or land-clearing activities, the Applicant shall file with FERC, for approval, a plan for clearing the reservoir area. The plan, at a minimum, shall include: (1) topographic maps identifying the location and acreage of lands to be cleared; (2) descriptions of the vegetation to be cleared; (3) descriptions of any resource management goals related to fish and wildlife enhancement through vegetative clearing or retention; (4) descriptions of the disposal methodologies and disposal location of unused timber, brush and refuse, and maps identifying the location of disposal sites; and (5) an implementation schedule. The Applicant shall prepare the plan after consultation with the USDA Forest Service. The Applicant shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. The FERC reserves the right to require changes to the plan. No land-disturbing or land-clearing activities shall begin until the Applicant is notified, by FERC, that the plan is approved. Upon FERC approval, the Applicant shall implement the plan, including any changes required by FERC.

Wetland/Waters Delineations

Concurrently with the sensitive plant surveys, qualified wetland specialists would conduct jurisdictional delineations wetland and waters. Wetlands and waters would be delineated in areas where they could be impacted by the project; canyon areas crossed by primary transmission lines that would not be affected by construction would not be included in the delineation. Wetland determination and delineation surveys would be conducted and reports prepared based on the delineation process for routine determinations as described in the 1987 Corps Wetland Delineation Manual (Environmental Laboratory, 1987) and on the definition used to identify wetlands adopted by the Corps 33 Code of Federal Regulations 323.2(c) in its administration of the Section 404 permit program of the Clean Water Act.

Mapping of wetlands would be conducted using a Trimble GPS unit with sub-meter accuracy, and wetland mapping data and project design plans should be incorporated into a Geographic Information System (GIS) platform to allow for quantification of jurisdictional areas and identification of impact areas. This would allow for the presentation and analysis of information in a format that can be efficiently interpreted by Nevada Hydro and state and federal agencies to facilitate wetlands/waters impacts avoidance, minimization, and/or other mitigation strategies.

3.4 Rare, Threatened & Endangered Species

As identified in the discussion of PMEs above, the applicant intends to develop appropriate study protocols for new surveys of sensitive and special status species, consult with agencies, and conduct new surveys in the upcoming field season. These may include updated habitat assessments, protocol level surveys to determine the presence or absence of species, rare plant field surveys, and updated jurisdictional delineations of wetlands, addressing special status plants and wildlife.

3.4.1 Methodology to Update Special-Status Species

In 2017, the Applicant updated special status species with potential to occur in the previously proposed project area, including those occurring in the vicinity of the pumped storage hydro project and in a half-mile vicinity of the primary transmission lines that were being considered at that time. This update considered all potential species and critical habitat occurrence within this area, which was identified in this section as the “previous project area”. It is conservative in reaching beyond the boundary of the project currently envisioned in this amended application but is provided below as a starting point for moving forward with assessment of the current project configuration.

The 2017 update referenced the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) (CDFW 2017a), the U.S. Fish and Wildlife Service (USFWS) Environmental Conservation Online System (USFWS 2017a), the California Native Plant Society (CNPS) online Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2017), and the Carlsbad Fish & Wildlife Office Species Occurrence Data GIS shapefiles (USFWS 2017b).

The CNDDB and CNPS search area included a “nine-quad” search, including the U.S. Geological Survey (USGS) 7.5-minute quadrangles (quad) in which the project area is located (Lake Mathews, Lake Elsinore, Alberhill, Wildomar, Sitton Peak, Fallbrook, and Margarita Peak), and the adjoining quads (Perris, Steele Peak, Corona South, Romoland, Santiago Peak, Murrieta, Canada Gobernadora, Temecula, San Clemente, Bonsall, Morro Hill, Las Pulgas Canyon, and San Onofre Bluff).

The USFWS databases were queried using the half-mile primary transmission line corridor.

Other information sources consulted to determine the current potential occurrence of special-status species within the project area included:

- “Exhibit E, Environmental Report, Section 3.0, Fish, Wildlife and Botanical Resources” of the Final Application for License of Major Unconstructed Project (Exhibit E, Nevada Hydro 2017)
- Aerial photographs, including Google Earth

- CALFIRE historical fire data for the period 2007 to 2016
- USFS Region 5 Regional Forester's 2013 Sensitive Animal Species List; Cleveland National Forest (USFS 2013a)
- United States Forest Service (USFS) Region 5 Regional Forester's 2013 Sensitive Plant Species List; Cleveland National Forest (USFS 2013b)
- Environmental reviews conducted pursuant to the California Environmental Quality Act (CEQA) which documents surveys or habitat assessments conducted in the past 5 years for sensitive species in proximity to the project area, including: Valley-Ivyglen 115-KV Substation Transmission Line and Alberhill Systems Projects Draft Environmental Impact Report (EIR); April 2016 (Ecology and Environment, Inc 2016)
- Santa Margarita River Conjunctive Use Project Draft Environmental Impact Statement (EIS)/EIR; May 2014 (USMC 2014)
- Santa Margarita River Conjunctive Use Project Final EIS/EIR; September 2016 (USMC 2016)
- Draft EIR for the Santa Ana River Parkway Extension Project Biological Resources Report; December 2015 (AECOM 2015)
- Draft EIR for the Lake Wohlford Dam Replacement Project EIR; October 2016 (AECOM 2016)
- City of Lake Elsinore East Lake Specific Plan Draft EIR; April 2017 (VCR Environmental 2017a)
- Biological Technical Report for the East Lake Specific Plan Amendment No. 11; March 2017 (VCS Environmental 2017b)
- Arroyo Toad (Anaxryus californicus) Focused Survey for the San Diego Gas and Electric Cleveland National Forest Master Services Permit Project San Diego County, California; February 2011 (Chambers Group, Inc.)

A plant or wildlife species was considered special status if it met one or more of the following criteria:

- A species listed as or a candidate for listing as endangered or threatened under the federal Endangered Species Act (CDFW 2017b)
- A species listed as or a candidate for listing as endangered or threatened under the California Endangered Species Act (CDFW 2017b)
- A species identified by the CDFW as a species of special concern or fully protected species (CDFW 2017b)
- A species listed as rare under the California Native Plant Projection Act (CDFW 2017b)
- A species included on Lists 1 and 2 of the California Rare Plant Ranks (CNPS 2017)

A broad list of special status plant species having potential to occur in the project area was developed from the "nine-quad" database review and Exhibit E. The resulting list of special status plants is included as Table E.3-13. Biologists reviewed available information on flowering time, conservation status, habitat preferences, phenology, geographic distribution, elevation, and known locations in the vicinity of the project.

A similarly broad list of special status wildlife species having potential to occur in the project area was compiled based on the presence of historic records within five miles or potentially suitable habitat within the project area. The list of special status wildlife with potential to occur in the project area is provided in Table E.3-14.

The broad lists of special status species were then narrowed to identify species that could occur in the project area, based on the known range of the species, the occurrence of suitable habitat, known migration routes, and whether recorded occurrences represented historical or contemporary presence. The following general categories were used:

- Observed: Previous surveys documented the presence of the species in the project area.
- High: The species has a strong likelihood to be found in the project area but has not been directly observed to date. The project area contains suitable habitat that meets the life history requirements on the species, either seasonally or perennially, and is within the know range of the species. Occurrences of the species have been documented outside of the project area, and no barriers to migration into the project area are known.
- Moderate: The species could possibly be found in the project area but it has not been directly observed to date. The project area contains potentially suitable habitat for the species.
- Low: The species has a low probability to occur in the project area, but the species potential presence cannot be discounted. The project area contains marginal habitat for the species, for example because it is fragmented or small in size, and there may be known occurrences near the project area, but not within the area.
- Unlikely: Species for which there are no recorded occurrences within contemporary records (<25 years). If species is known from the vicinity, the required habitat is absent or the existing habitat has not been shown to be within the known range of the species.

3.4.2 Critical Habitat

Critical habitat is defined in Section 3 of the Federal Endangered Species Act (FESA) as: (1) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the FESA, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. Critical habitat receives protection under Section 7 of the FESA through prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a Federal agency. Section 7 also requires conferences on Federal actions that are likely to result in the destruction or adverse modification of proposed critical habitat. Critical habitat designated (CHD) areas within the general vicinity of the projects are described below.

The previous filing for the license application identified designated critical habitat areas for Quino checkerspot butterfly, coastal California gnatcatcher (proposed), least Bell's vireo, southern willow flycatcher, and Munz's onion within or in close proximity to specific components of the proposed project. However, a review of currently designated critical habitat determined that critical habitats previously identified as potentially affected by the U.S. Fish and Wildlife Service is no longer found in the project area or along the primary transmission line for Quino checkerspot butterfly, southwestern willow flycatcher, least Bell's vireo, California red-legged frog, Munz's onion, and riverside fairy shrimp.

- Quino checkerspot butterfly. Designated critical habitat for this species is no longer found within the project area. In 2009, the USFWS acted to exclude approximately 109,479 acres from the 2002 designation of critical habitat for the Quino checkerspot butterfly, including those proposed units which were crossed by the primary transmission line.
- Southwestern willow flycatcher. Although southern willow flycatcher was identified in the previous filing, designated critical habitat for this species did not actually occur within the project area. In 2011,

critical habitat for this species was revised to add the De Luz Creek Unit, located approximately 2.5 miles southeast of the south end of the primary transmission line.

- Least Bell's vireo. Although least Bell's vireo was identified in the previous filing, designated critical habitat for this species did not occur within the project area, and currently does not occur within the project area.
- California red-legged frog. Although new critical habitat for California red-legged frog has been designated since 2007, it does not fall within the project area.

Critical habitat has been designated in areas potentially affected by the project for arroyo toad, thread-leaved brodiaea, and coastal California gnatcatcher. Potentially, critical habitat for Munz's onion may also occur, and critical habitat for the riverside fairy shrimp occurs in close proximity to the pumped hydro storage facility.

Table E.3-12 shows a summary of the status of special status species and critical habitat in the previous filing.

Table E.3-12:Summary of Species and Critical Habitat

Species	Species Status	Species Finding	Critical Habitat Finding
Southern California steelhead (Oncorhynchus mykiss)	E	Likely to adversely affect	Not likely to adversely affect
San Diego thornmint (Acanthomintha ilicifolia)	T	Likely to adversely affect	No effect
San Diego button-celery (Eryngium aristulatum var. parishii)	E	Likely to adversely affect	No effect
Mexican flannelbush (Fremontodendron mexicanum)	E	No effect	No effect
Spreading navarretia (Navarretia fossalis)	T	Likely to adversely affect	No effect
Nevin's barberry (Berberis nevinii)	E	Likely to adversely affect	No effect
Munz's onion (Allium munzii)	E	Likely to adversely affect	No effect
Slender-horned spine flower *(Dodecahema leptoceras)*	E	Likely to adversely affect	No effect
San Diego ambrosia *(Ambrosia pumila)*	E	Likely to adversely affect	No effect
California Orcutt grass *(Orcuttia californica)*	E	Likely to adversely affect	No effect
Thread-leaved brodiaea *(Brodiaea filifolia)*	T	Likely to adversely affect	No effect
San Jacinto Valley crownscale *(Atriplex coronata var. notatior)*	E	Likely to adversely affect	No effect
Quino checkerspot butterfly *(Euphydryas edith quino)*	E	Likely to adversely affect	Likely to adversely affect
Arroyo toad *(Bufo californicus)*	E	Likely to adversely affect	No effect

Species	Species Status	Species Finding	Critical Habitat Finding
California red-legged frog *(Rana aurora draytonii)*	T	No effect	No effect
Southwestern willow flycatcher *(Empidonax traillii extimus)*	E	Likely to adversely affect	No effect
Least Bell's vireo *(Vireo bellii pusillus)*	E	Likely to adversely affect	No effect
Bald eagle *(Haliaeetus leucocephalus)*	T	Not likely to adversely affect	No effect
Coastal California gnatcatcher *(Polioptila californica)*	T	Likely to adversely affect	Likely to adversely affect (proposed)
Stephens' kangaroo rat *(Dipodomys stephensi)*	E	Likely to adversely affect	Likely to adversely affect

Figure E.3-1:USFWS designated critical habitat for Munz's onion depicted in pink.

Munz's onion. On June 7, 2005, the USFWS issued a final rule (70 FR 33015-33033) establishing a critical habitat designation for the Munz's onion, totaling 176 acres. The final rule stated: "We [USFWS] have not designated critical habitat on U.S. Forest Service lands that fall within the Project corridor. Our analysis indicates that the primary constituent elements are not present along the easternmost boundary of the proposed critical habitat unit and, therefore, those lands have not been designated as critical habitat" (70 FR 33030). However, in its July 3, 2014 letter to Nevada Hydro, the USFWS included Munz's onion in a list of new designated critical habitats since the 2007 FEIS.

Designated critical habitat for the Munz's onion occurs south of the I-15 Freeway and within the National Forest (near Elsinore Peak), which is no longer within the proposed project area of this amended application.

Riverside fairy shrimp. Designated critical habitat for this species was not previously found in the project area. The 2012 final designated critical habitat for this species contains one unit just outside the project area: 3C Riverside Inland Valleys - Australia Pool, which is approximately 150 feet from the shoreline of Lake Elsinore (Figure E.3-2). Subunit 3C was excluded from the final critical habitat designation under section 4(b)(2) of the endangered species act, as it is covered by an approved habitat conservation plan. However, Subunit 3C is conserved or will be conserved in the Western Riverside County MSHCP Conservation Area and therefore represents key habitat proximate to the project. The plan protects Riverside fairy shrimp within the plan area by ensuring the species is conserved within 90 percent of an occupied area (County of Riverside 2003). All vernal pool habitat within the Western Riverside County MSHCP Conservation Area will be conserved.

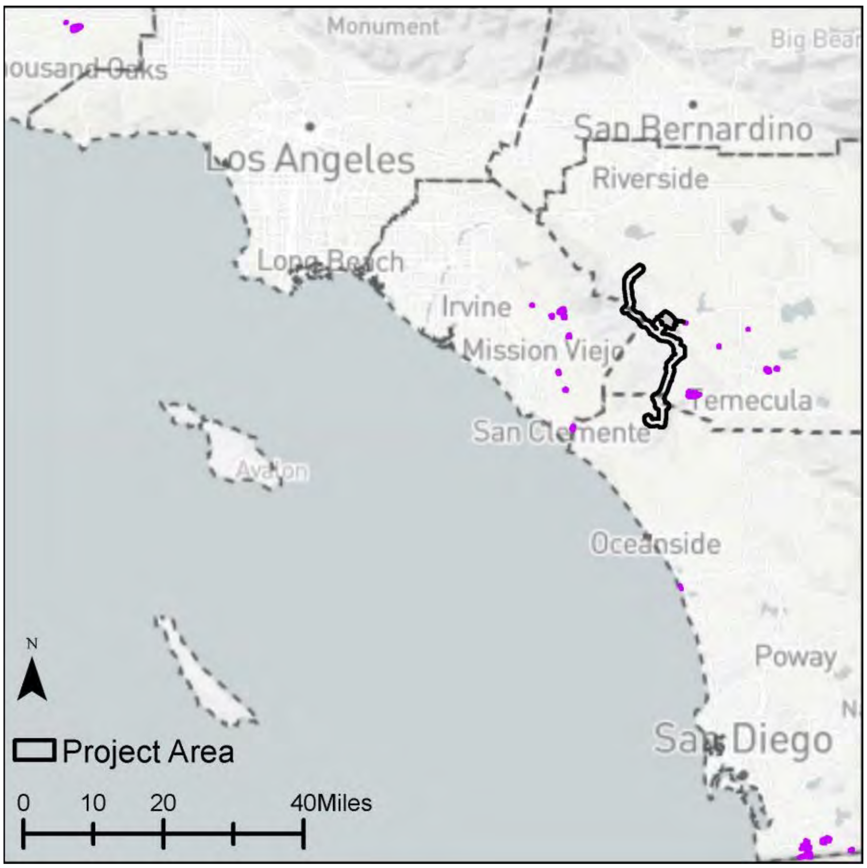

Figure E.3-2: USFWS designated critical habitat for the Riverside fairy shrimp depicted in purple.

Arroyo toad. Designated critical habitat for this species was not previously found in the project area, but was revised in 2011, and several units were determined to extend into the previously proposed project area. However, based on the new configuration, there are no areas of overlap with the currently proposed project configuration.

Figure E.3-3: USFWS designated critical habitat for the Arroyo toad depicted in light green.

Thread-leaved brodiaea. Designated critical habitat for this species is not found in the currently proposed project area for this amended application.

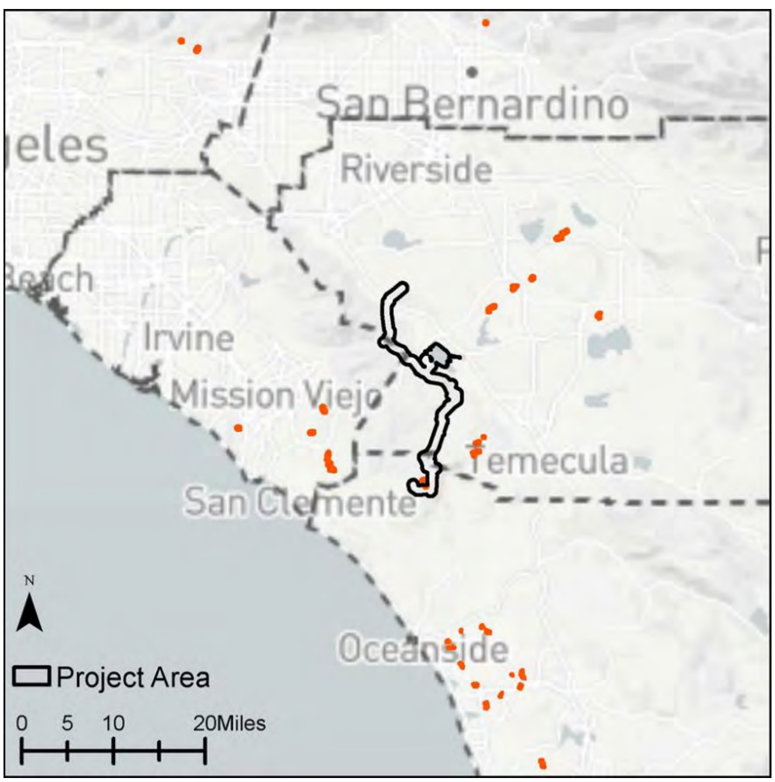

Figure E.3-4: USFWS designated critical habitat for thread-leaved bordiaea depicted in orange.

Coastal California gnatcatcher. Designated critical habitat for coastal California gnatcatcher was previously identified in the project area, and since 2007 the designated critical habitat for this species has not changed (Figure 3-6). In 2007 (effective 2008), designated critical habitat for the Coastal California gnatcatcher was revised to exclude the majority of areas within the Western Riverside County Multiple Species Habitat Conservation Plan proposed for designation in the project area. However, 11,401 acres of Unit 10 – Western Riverside County Multiple Species Habitat Conservation Plan were included in the final designation that intersect the northern section of the primary transmission line, primarily consisting of federally owned lands that contain features essential to the conservation of the species and which may require special management considerations and protection This unit also encompasses contiguous habitats in southern San Bernardino County, including essential coastal California gnatcatcher populations in the Jurupa Hills, and the Blue Mountain/Reche Canyon region. Though not included, the Santa Ana River may be an important movement corridor in this area, connecting the Jurupa and La Loma Hills to populations in the Box Springs Mountains, as well as to the few pairs known from the Pedley Hills and Norco Hills. Though a few coastal California gnatcatcher have been observed from the upper Santa Ana River wash in the vicinity of Highland, the USFWS does not yet have evidence that this area constitutes a core population. Further surveys in this area may help clarify its use by the coastal California gnatcatcher.

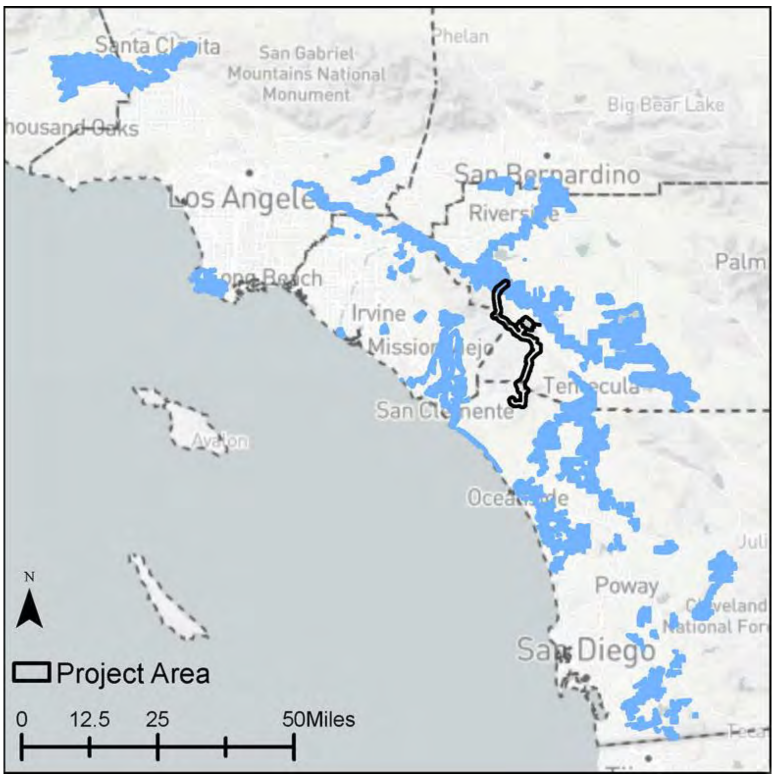

Figure E.3-5: USFWS designated critical habitat for the Coastal California gnatcatcher depicted in light blue.

Habitat within this unit was designated because it was occupied at the time of listing, is currently occupied, and contains all of the features essential to the conservation of the coastal California gnatcatcher. Additionally, this unit provides for connectivity and genetic interchange among core populations and contains large blocks of high-quality habitat capable of supporting persistent populations of coastal California gnatcatcher. The primary transmission currently proposed in this amended application would still traverse the Temescal Wash, so there is potential to encounter this species.

3.4.3 Special Status Botanical Resources

In September 2017, Nevada Hydro updated the list of special status species with potential to occur in the project area being considered at that time, including those occurring in the vicinity of the pumped hydro storage project and within a half-mile corridor of the proposed primary transmission lines being considered at that time. The half-mile primary transmission corridor in the vicinity of the project includes the area within the FERC project boundary. The results of the 2017 CNDDB search are shown in Figure E.3-6. The location of the currently proposed primary transmission line is approximated on this map in “blue”.

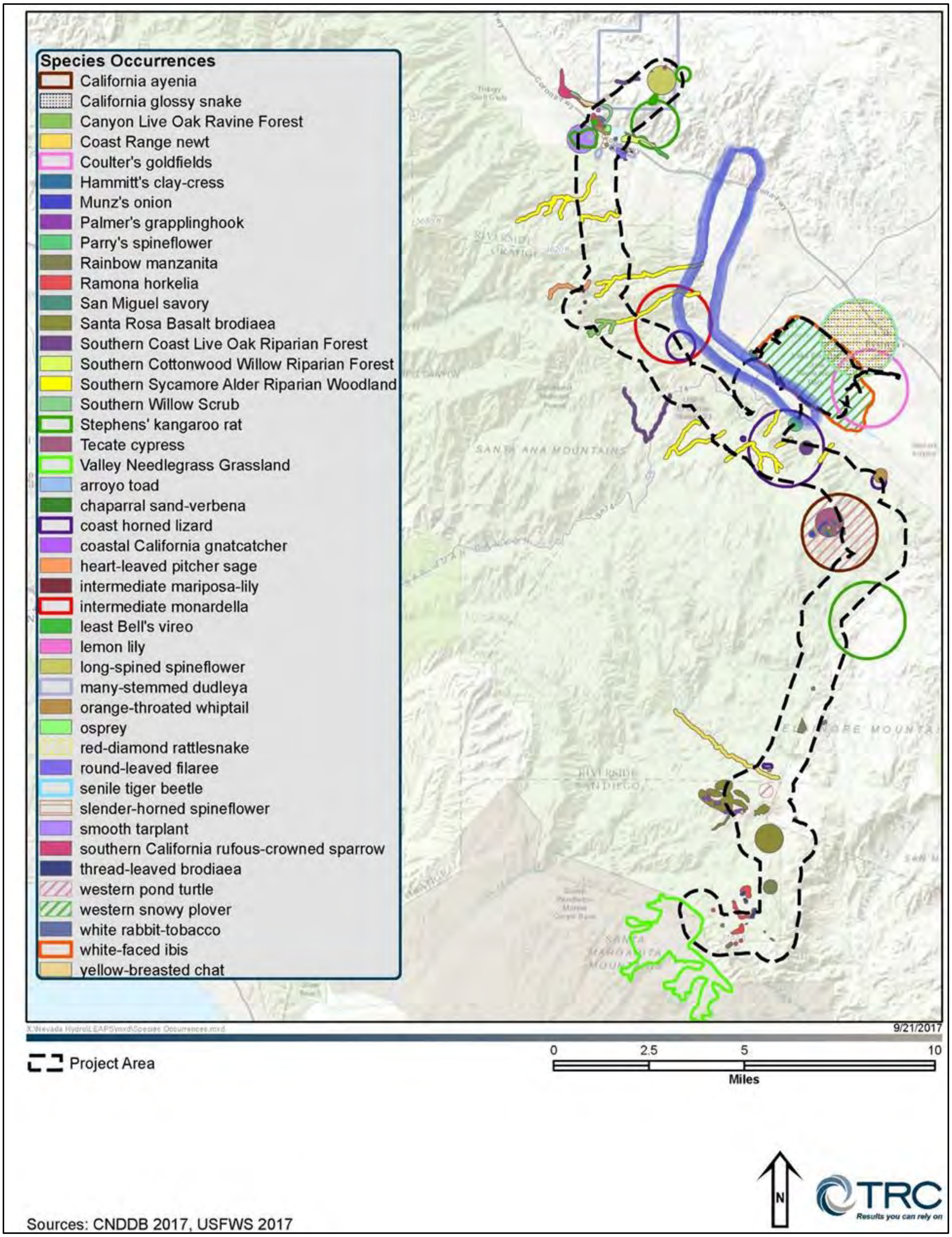

Figure E.3-6: CNDDB search results within a 0.5-mile corridor of the project area.

3.4.4 Special Status Plant Species

In 2006, the sensitive plants that were known or likely to occur along the southern primary transmission line included San Diego County viguiera (*Viguiera lacintata*) (CNPS List 4), Fish's milkwort (*Polygala cornuta ssp. fishiae*) (CNPS List 4), sticky dudleya (*Dudleya viscida*) (CNPS List 1B), and prostate spineflower (*Chorizanthe procumbens*) (CNPS List 4).

Previously, in its 2007 FEIS, FERC had concluded that licensing the project would be likely to adversely affect San Diego thornmint, San Diego button-celery, spreading navarretia, Nevin's barberry, Munz's onion, slender-horned spine flower, San Diego ambrosia, California Orcutt grass, thread-leaved brodiaea, and San Jacinto Valley crownscale.

The following four special status (listed or sensitive) plant species were documented near the Project during six years of focused surveys: Munz's onion, heart-leaved pitcher sage, rainbow Manzanita, and Hammitt's clay-cress. In addition, although not observed during six years of focused plant surveys, the following special status (non-listed, sensitive) plants species have moderate to high potential to occur based on the habitats present and/or documented in California Natural Diversity Database (CNDDB) or USDA Forest Service records: Davidson's saltscale, thread-leaved brodiaea, Orcutt's brodiaea, long-spined spineflower, summer holly, slender-horned spineflower, many-stemmed dudley, sticky dudleya, San Diego button-celery, Coulter's goldfields, Parish's meadowfoam, Hall's monardella, California Orcutt grass, San Miguel savory, and Parry's tetracoccus.

Based on the updated 2017 literature review, a total of 107 special status plant species were identified as having potential to occur in the project area (Table E.3-13). Of these, 3 were observed during focal studies conducted between 2001 and 2006, and were known to occur within the proposed project area:

- Rainbow manzanita (*Arctostaphylos rainbowensis*)
- Ocellated Humboldt lily (*Lilium humboldtii ssp. ocellatum*)
- Coulter's matilija poppy (*Romneya coulteri*)

In addition to these three observations, 41 special status plant species have moderate or high potential to occur in the project area and may be impacted by project development. These species are included in Table E.3-13, and among them are 31 species that were previously identified as having moderate or high potential to occur. The following 10 species were not previously identified as having moderate or high potential to occur, but are reasonably probable to have some potential to occur based on the updated literature review:

- Santa Monica dudleya (*Dudleya cymosa ssp. ovatifolia*)
- Santa Ana River woollystar (*Eriastrum densifolium ssp. sanctorum*)
- Vanishing wild buckwheat (*Erigonum evanidum*)
- San Diego barrel cactus (*Ferocactus viridescens*)
- Tecate cypress (*Hesperocyparis forbesii*)
- Intermediate monardella (*Monardella hypoleuca ssp. intermedia*)
- Santiago Peak phacelia (*Phacelia suaveolens ssp. keckii*)
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*)
- Salt spring checkerbloom (*Sidalcea neomexicana*)
- La Purisima viguiera (*Viguiera purisimae*)

3.4.4.1 Sensitive natural communities.

In 2006, the CNDDB listed eight special status plant communities as occurring within the general Project area: canyon live oak ravine forest, southern coast live oak riparian forest, southern cottonwood willow riparian forest, southern interior basalt flow vernal pool, southern riparian forest, southern sycamore alder riparian woodland, southern willow scrub, and valley needlegrass grassland. These communities are considered sensitive due to limited distribution, historic losses, and perceived threats, such as further losses to urban development and degradation of habitat quality by human disturbance, including invasion by exotic ruderal species.

The 2001-2006, surveys identified three special status plant communities (southern coast live oak riparian forest, southern sycamore alder riparian woodland, and southern willow scrub) as occurring within the Project area. See Figure E.3-7.

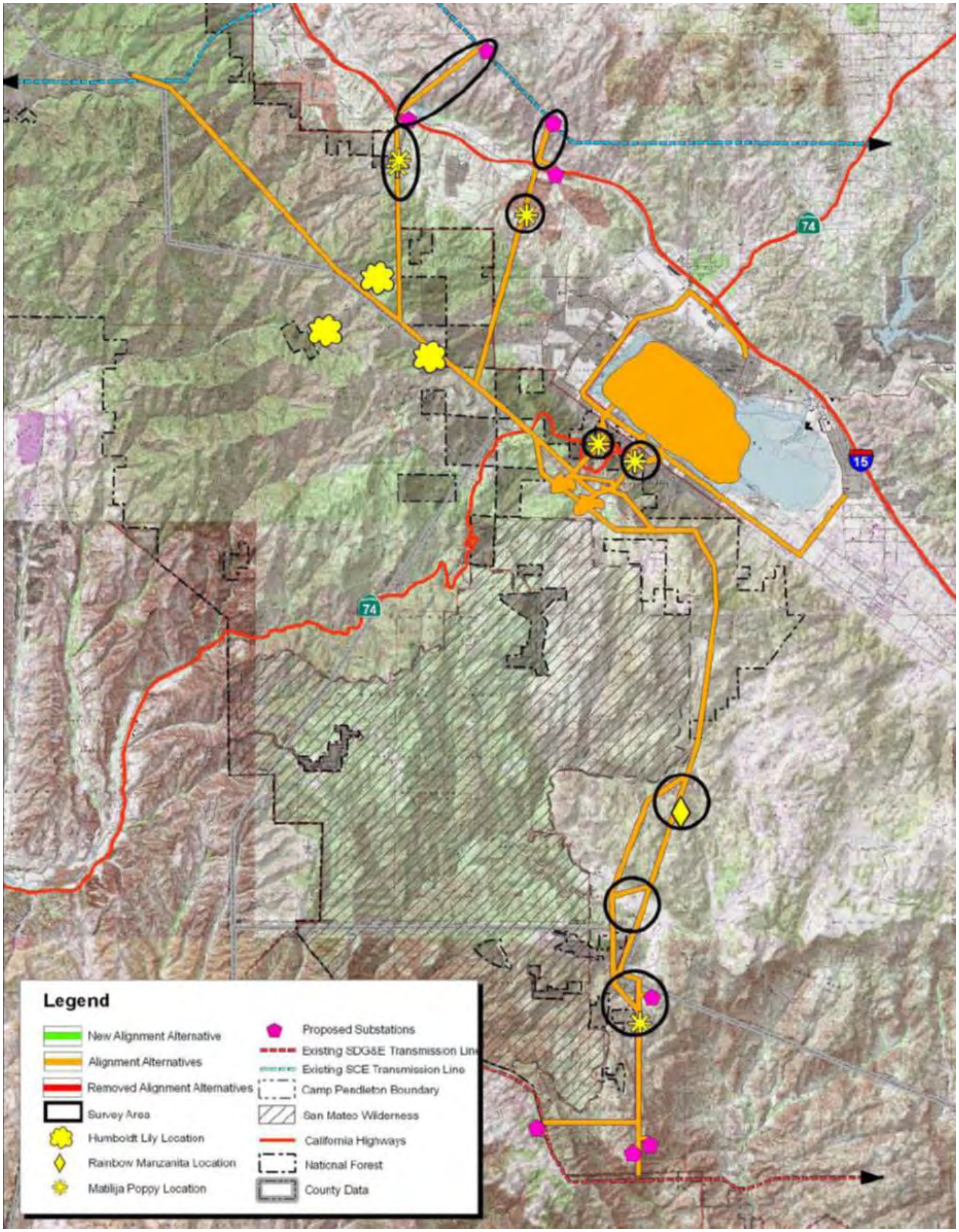

Figure E.3-7: Focused Special Status Plant Survey Areas
Source: Michael Brandman Associates

Table E.3-13: Special-Status Plants with Potential to Occur in Project Area

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Abronia villosa var. aurita	Chaparral sand-verbena	None	None	1B.1 FS	Annual herb	(Jan) Mar - Sep	Sandy benches and floodplains with openings in coastal sage scrub or chaparral. USFS Cleveland NF listed (< 5,000)	Unlikely - Herbarium specimens collected near Lake Elsinore but no suitable habitat present in the coastal sage scrub in the project area.
Acanthomintha ilicifolia	San Diego thorn-mint	FT	SE	1B.1 FS	Annual herb	Apr - Jun	Chaparral, coastal scrub, vernal pools (clay), valley foothill grasslands (30 to 3,000)	Moderate - Known from the vicinity. Suitable habitat present in the project area.
Allium munzii	Munz's onion	FE	ST	1B.1 FS	Perennial herb; bulbiferous	Mar - May	Chaparral, coastal scrub, cismontane woodland, pinyon-juniper woodland, grassland (1,000 to 3,400)	High - Known from the immediate vicinity. Suitable habitat present in project area.
Almutaster pauciflorus	Alkali marsh aster	None	None	2B.2	Perennial herb	Jun - Oct	Alkaline meadows and seeps (780 to 2,625)	Unlikely - Known from the vicinity. No suitable habitat observed as present in the project area.
Ambrosia pumila	San Diego ambrosia	FE	None	1B.1	Perennial herb; rhizomatous	Apr – Oct	Upper terraces of rivers, openings in coastal scrub and grassland, occ. adjacent to vernal pools (60 to 1,300)	Moderate - Known from one distinct population NE of Lake Elsinore. Suitable habitat potentially present in the project area.
Arctostaphylos rainbowensis	Rainbow manzanita	None	None	1B.1 FS	Shrub; evergreen	Dec - Mar	Chaparral. USFS Cleveland NF listed (675 to 2,200)	Observed - Observed 2001-2006 during focused surveys.
Astragalus brauntonii	Braunton's milk-vetch	FE	None	1B.1 FS	Perennial herb	Jan - Aug	Closed-cone conifer forests, chaparral, coastal sage scrub, grasslands, recently burned or disturbed areas, associated with carbonate deposits (10 to 2,100)	Unlikely - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat is present, but the project area lies east of the species' known range.
Astragalus deanei	Deane's milk vetch	None	None	1B.1 FS	Perennial herb	Feb - May	Chaparral, cismontane woodland, coastal scrub, riparian scrub. USFS Cleveland NF listed (240 to 2,300)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Astragalus douglasii var. perstrictus	Jacumba milk vetch	None	None	1B.2 FS	Perennial herb	Apr - Jun	Chaparral, cismontane woodland, pinyon and juniper woodland, riparian scrub, valley and foothill grassland/ rocky. USFS Cleveland NF listed (3,000 to 4,500)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Astragalus oocarpus	San Diego milkvetch	None	None	1B.2 FS	Perennial herb	May - Aug	Chaparral (openings), cismontane woodland. USFS Cleveland NF listed (1,000 to 5,000)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Astragalus pachypus var. jaegeri	Jaeger's milk vetch	None	None	1B.1 FS	Shrub	Dec - Jun	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland Sandy or rocky. USFS Cleveland NF listed (1,200 to 3,000)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Atriplex coronata var. notatior	San Jacinto Valley crownscale	FE	None	1B.1	Annual herb	Apr - Aug	Playas, chenopod scrub, valley and grassland (mesic), vernal pools (450 to 1,650)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Atriplex coulteri	Coulter's saltbush	None	None	1B.2	Perennial herb	Mar - Oct	Alkaline or clay soils. Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland (10 to 1,510)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Atriplex parishii	Parish's brittlescale	None	None	1B.1 FS	Annual herb	Jun - Oct	Alkaline soils. Chenopod scrub, playas, vernal pools. USFS Cleveland NF listed (80 to 6,235)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Ayenia compacta	California ayenia	None	None	2B.3	Perennial herb	Mar - Apr	Rocky soils. Mojavean desert scrub, Sonoran Desert scrub (490 to 3,600)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Baccharis vanessae	Encinitas baccharis	FT	SE	1B.1 FS	Shrub; deciduous	Aug - Nov	Chaparral (maritime), sandstone deposits, cismontane woodlands (200 to 2360)	Unlikely - No known occurrences in the vicinity. Suitable habitat is present in the project area, but the project area lies east of the species' known range.
Berberis nevinii	Nevin's barberry	FE	SE	1B.1 FS	Shrub	(Feb) Mar - Jun	Chaparral, cismontane woodland, coastal sage scrub, riparian scrub, sandy or gravelly soils (230 to 2,700)	Moderate - Known populations well documented, however none known from the vicinity. Suitable habitat present in the project area.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Brodiaea filifolia	Thread-leaved brodiaea	FT	SE	1B.1 FS	Perennial herb; bulbiferous	Mar - Jun	Coastal scrub, cismontane woodland, coastal scrub, playas, valley and foothill grasslands, vernal pools, clay soils (80 to 3,700)	Unlikely - Not known from the vicinity. Project area lies outside the species' range.
Brodiaea orcuttii	Orcutt's brodiaea	None	None	1B.1 FS	Perennial herb; bulbiferous	May - Jul	Closed-cone coniferous forest, chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools. USFS Cleveland NF listed (100 to 5,550)	High - Known from the vicinity. Suitable habitat present in the project area.
Brodiaea santarosae	Santa Rosa basalt brodiaea	None	None	1B.2 FS	Perennial herb; bulbiferous	May - Jun	Basaltic soils. Valley and foothill grassland. USFS Cleveland NF listed (1,855 to 3,430)	Low - Known from the vicinity. Marginally suitable habitat present in the project area
California macrophylla	Round-leaved filaree	None	None	1B.2	Annual herb	Mar - May	Cismontane woodland, valley and foothill grassland (50 to 3,940)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Calochortus dunnii	Dunn's mariposa lily	None	SR	1B.2 FS	Perennial herb; bulbiferous	(Feb) Apr - Jun	Closed-cone conifer forest, chaparral/ gabbroic, valley and foothill grassland. USFS Cleveland NF listed (1,200 to 6,000)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Calochortus plummerae	Plummer's mariposa lily	None	None	4.2	Perennial herb; bulbiferous	May - Jul	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest, rocky or sandy sites (600 to 6,000)	Moderate - Known from the vicinity. Suitable habitat present in the project area.
Calochortus weedii var. intermedius	Intermediate mariposa lily	None	None	1B.2 FS	Perennial herb; bulbiferous	May - Jul	Coastal scrub, chaparral, valley, and foothill grassland in dry, rocky open slopes and rock outcrops. USFS Cleveland NF listed (600 to 2,805)	Unlikely - Not known from the vicinity. No suitable habitat observed as present in the project area.
Castilleja lasiorhyncha	San Bernardino Mountains owls' clover	None	None	1B.2 FS	Annual herb; hemi-parasitic	May - Aug	Chaparral, meadows and seeps, pebble (pavement) plain, upper montane coniferous forest, riparian woodland. USFS Cleveland NF listed (4,250 to 7,800)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Caulanthus simulans	Payson's jewel flower	None	None	4.2 FS	Annual herb	(Feb) Mar – May (Jun)	Chaparral and coastal scrub, sandy soils with granitic substrate. USFS Cleveland NF listed (300 to 7,200)	Unlikely - Not known from the vicinity. No sandy areas observed in the coastal sage scrub habitat in the project area.
Ceanothus cyaneus	Lakeside ceanothus	None	None	1B.2 FS	Shrub, evergreen	Apr - Jun	Closed-cone conifer forest, chaparral. USFS Cleveland NF listed (700 to 2,500)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Ceanothus ophiochilus	Vail Lake ceanothus	None	None	1B.1 FS	Shrub; evergreen	Feb - Mar	Chaparral (gabbroic or pyroxenite-rich outcrops). (1,900 to 3,500)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Centromadia parryi ssp. australis	Southern tarplant	None	None	1B.1	Annual herb	May - Nov	Marshes and swamps (margins), valley and foothill grassland (vernally mesic), vernal pools (0 to 1,575)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Centromadia pungens ssp. laevis	Smooth tarplant	None	None	1B.1	Annual herb	Apr - Sep	Chenopod scrub, wet meadows, seeps, playas, riparian woodlands, valley and foothill grassland, alkaline soils (0 to 2,100)	Unlikely – Known from the vicinity of the project area. No suitable habitat present in the project area.
Chorizanthe parryi var. parryi	Parry's spineflower	None	None	1B.1 FS	Annual herb	Apr - Jun	Sandy openings in chaparral, cismontane woodland, coastal scrub, valley and foothill grassland USFS Cleveland NF listed (900 to 4,000)	Unlikely - No recorded occurrences within the vicinity of the project area. No sandy areas observed in the coastal sage scrub in the project area.
Chorizanthe polygonoides var. longispina	Long-spined spineflower	None	None	1B.2 FS	Annual herb	Apr - Jul	Chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools (100 to 5,200)	High - Known from the vicinity. Suitable habitat present in the project area.
Chorizanthe procumbens	Prostrate spineflower	None	None	None	Annual herb	Apr - Jun	Coastal sage scrub, chaparral (< 2,600)	Moderate - No recorded occurrences within the vicinity of the project area. Suitable habitat present in the project area, and the project area lie within the species' range.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Chorizanthe xanti var. leucotheca	White-bracted spineflower	None	None	1B.2	Annual herb	Apr - Jun	Sandy or gravelly soils. Coastal scrub (alluvial fans), Mojavean desert scrub, pinyon and juniper woodland (985 to 3,940)	Low - Known from the vicinity. Marginally suitable habitat potentially present in the project area.
Clarkia delicata	Delicate clarkia	None	None	1B.2 FS	Annual herb	Apr - Jun	Chaparral, cismontane woodland (770 to 3,300)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Clinopodium chandleri	San Miguel savory	None	None	1B.2 FS	Perennial shrub	Mar - Jul	Chaparral, cismontane woodland, coastal scrub, riparian woodland, grassland. USFS Cleveland NF listed (400 to 3,530)	High - Known from the vicinity. Suitable habitat present in the project area.
Comarostaphylis diversifolia ssp. diversifolia	Summer holly	None	None	1B.2	Shrub; evergreen	Apr - Jun	Chaparral, cismontane woodland (90 to 2,600)	High - Known from the vicinity. Suitable habitat present in the project area.
Deinandra (hemizonia) floribunda	Tecate tarplant	None	None	1B.2 FS	Annual herb	Aug – Oct	Chaparral, coastal scrub. USFS Cleveland NF listed (230 to 4,000)	Moderate- No recorded occurrence within the vicinity of the project area. Suitable habitat present in the project area.
Deinandra mohavensis	Mojave tarplant	None	None	1B.3 FS	Annual herb	(May) Jun – Oct (Jan)	Chaparral, riparian scrub, coastal scrub. USFS Cleveland NF listed (2,100 to 5,250)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Delphinium hesperium ssp. cuyamacae	Cuyamaca larkspur	None	None	1B.2 FS	Perennial herb	May - Jul	Lower montane coniferous forest, meadows and seeps, vernal pools USFS Cleveland NF listed (4,000 to 5,400)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Dieteria asteroides var. lagunensis	Mt. Lagnua aster	None	None	2B.1 FS	Perennial herb	(May) Jul - Aug	Cismontane woodland, lower montane coniferous forest. USFS Cleveland FS listed (2,600 to 7,875)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Dodecahema leptoceras	Slender-horned spineflower	FE	SE	1B.1 FS	Annual herb	Apr - Jun	Sandy alluvial benches, floodplain terraces with alluvial fan sage scrub (650 to 2,500)	High - Known from Temescal Wash in the vicinity of the project area. Suitable habitat potentially present in the Temescal Wash in the project area.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Dudleya blochmaniae ssp. blochmaniae	Blochman's dudleya	None	None	1B.1	Perennial herb	Apr - Jun	Rocky, often clay or serpentinite soils. Coastal bluff scrub, chaparral, coastal scrub, valley and foothill grassland (16 to 1,480)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Dudleya cymosa	Canyon live-forever	None	None	FS	Perennial herb	Mar - Jul	Chaparral and coastal scrub habitats (400 to 1,800)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Dudleya cymosa ssp. ovatifolia	Santa Monica dudleya	FT	None	1B.1	Perennial herb	Mar - Jun	Volcanic or sedimentary, rock soils. Chaparral, coastal scrub. Known from fewer than 10 occurrences (490 to 5,495)	Moderate - Known from the vicinity. Suitable habitat present in the project area.
Dudleya multicaulis	Many-stemmed dudleya	None	None	1B.2 FS	Perennial herb	Apr - Jul	Chaparral, coastal scrub, valley and foothill grassland. USFS Cleveland NF listed (50 to 2,600)	High - Known from the vicinity. Suitable habitat present in the project area.
Dudleya viscida	Sticky dudleya	None	None	1B.2 FS	Perennial herb	May - Jun	Coastal scrub, cismontane woodland, coastal bluff scrub, chaparral. USFS Cleveland NF listed (<1,800)	High - Known from the vicinity. Suitable habitat present in the project area.
Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	FE	CE	1B.1	Perennial herb	Apr - Sep	Sandy or gravelly soils. Chaparral, coastal scrub (alluvial fan) (300 to 2,000)	Moderate - Known from the vicinity. Suitable habitat present in the project area.
Eriogonum evanidum	Vanishing wild buckwheat	None	None	1B.1 FS	Annual herb	Jul - Oct	Chaparral, cismontane woodland, lower montane coniferous forest, pinyon and juniper woodland. USFS Cleveland NF listed (3,600 to 7,300)	Moderate – No recorded occurrence within the vicinity of the project area. Suitable habitat present within the project area.
Eryngium aristulatum var. parishii	San Diego button-celery	FE	SE	1B.1	Annual/ perennial herb	Apr - Jun	Vernal pools, coastal scrub, valley and foothill grassland (65 to 2,000)	Moderate – No recorded occurrence within the vicinity of the project area. Suitable habitat present within the project area, and the project area lies within the species' range.
Ferocactus viridescens	San Diego barrel cactus	None	None	2B.1	Perennial stem succulent	May - Jun	Chaparral, coastal scrub, valley and foothill grassland, vernal pools (10 to 1,475)	Moderate - Known from the vicinity. Suitable habitat present in the project area.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Fremontodendron mexicanum	Mexican flannel bush	FE	SR	1B.1 FS	Shrub; evergreen	Mar - Jun	Closed-cone coniferous forest, chaparral, cismontane woodland. Gabbroic, metavolcanics, or serpintinite soils (30 to 2,400)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Galium angustifolium ssp. jacinticum	San Jacinto Mountains bedstraw	None	None	1B.3 FS	Perennial herb	Jun - Aug	Lower montane coniferous forests. Known from fewer than 10 occurrences. USFS Cleveland NF listed (4,430 to 6,900)	Unlikely - No recorded occurrence within the vicinity of the project area. Suitable habitat not known to be present in the project area.
Geothallus tuberosus	Campbell's liverwort	None	None	1B.1	Ephemeral liverwort	N/A	Coastal scrub (mesic), vernal pools (33 to 1,970)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Githopsis diffusa ssp. filicaulis	Mission Canyon bluecup	None	None	3.1 FS	Annual herb	Apr - Jun	Chaparral (mesic disturbed areas). USFS Cleveland NF listed (1,500 to 2,300)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Harpagonella palmeri	Palmer’s grapplinghook	None	None	4.2	Annual herb	Mar - May	Chaparral, coastal sage scrub, valley and foothill grassland (65 to 3,100)	Moderate - No recorded occurrence within the vicinity. Suitable habitat present in the project area, and the project area lies within the species’ range.
Hesperocyparis forbesii	Tecate cypress	None	None	1B.1 FS	Tree; evergreen	N/A	Closed-cone coniferous forest, chaparral. USFS Cleveland FS listed (260 to 4,200)	Moderate - Known from the vicinity. Suitable habitat present in the project area.
Hesperocyparis stephensonii	Cuyamaca cypress	None	None	1B.1 FS	Tree; evergreen	N/A	Closed-cone coniferous forest, chaparral, riparian forest, cismontane woodland. USFS Cleveland NF listed (3,400 to 5,600)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Heuchera abramsii	Abrams’ alumroot	None	None	4.3 FS	Perennial herb; rhizomatous	Jul - Aug	Upper montane coniferous forest (rocky). USFS Cleveland NF listed (9,200 to 11,500)	Unlikely - No recorded occurrence within the vicinity of the project area. Suitable habitat not known to be present in the project area.
Horkelia cuneata ssp. puberula	Mesa horkelia	None	None	1B.1 FS	Perennial herb	Feb – Jul (Sep)	Chaparral, cismontane woodland, coastal scrub, sandy or gravelly soils. USFS Cleveland NF listed (220 to 2,650)	Moderate - Known from the vicinity. Suitable habitat present in the project area.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Horkelia truncata	Ramona horkelia	None	None	1B.3 FS	Perennial herb	May - Jun	Chaparral, cismontane woodland. USFS Cleveland NF listed (1,300 to 4,300)	High - Known from the vicinity. Suitable habitat present in the project area.
Imperata brevifolia	California satintail	None	None	2B.1	Perennial herb; rhizomatous	Sep - May	Chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), riparian scrub (0 to 4,000)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Juncus luciensis	Santa Lucia dwarf rush	None	None	1B.2	Annual herb	Apr - Jul	Chaparral, great basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools (980 to 6,700)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	None	None	1B.1	Annual herb	Feb - Jun	Vernal pools, playas, marshes and swamps (3 to 4,000)	Moderate - No recorded occurrence within the vicinity of the sites. Suitable habitat present in the project area, and the project area lie within the species' range.
Lepechinia cardiophylla	Heart-leaved pitcher sage	None	None	1B.2 FS	Shrub	Apr - Jul	Closed-cone forest, chaparral, cismontane woodland. USFS Cleveland NF listed (1,700 to 4,500)	High - Known from the vicinity. Suitable habitat present in the project area.
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	None	None	4.3	Annual herb	Jan - Jul	Chaparral, coastal scrub, dry soils (1 to 2,900)	Moderate - Known from the vicinity. Suitable habitat present in the project area.
Lessingia glandulifera var. tomentosa	Warner springs lessingia	None	None	1B.1 FS	Annual herb	Aug, Oct	Chaparral (sandy). USFS Cleveland NF listed (2,850 to 4,000)	Unlikely - No recorded occurrence within the vicinity of the project area. Suitable habitat is present in the project area, but the project area lies outside of the species' known range.
Lewisia brachycalyx	Short-sepaled lewisia	None	None	2B.2 FS	Perennial herb	(Feb) Apr – Jun (Jul)	Lower montane coniferous forest, meadows and seeps. USFS Cleveland NF listed (4,500 to 7,550)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Lilium humboldtii ssp. ocellatum	Ocellated Humboldt lily	None	None	4.2	Perennial herb; bulbiferous	May – Jul (Aug)	Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, riparian forest (100 to 5,900)	Observed - Observed 2001-2006 during focused surveys.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Lilium parryi	Lemon lily	None	None	1B.2 FS	Perennial herb; bulbiferous	Jul - Aug	Lower montane coniferous forest, meadows and seeps, riparian scrub, upper montane coniferous forest. Mesic soils. USFS Cleveland NF listed (4,000 to 9,000)	Low - No recorded occurrence within the vicinity of the sites. Marginally suitable habitat present in the project area
Limnanthes alba ssp. parishii	Parish's meadowfoam	None	None	1B.2 FS	Annual herb	Apr - Jun	Wet meadows, seeps, vernal pools, lower montane coniferous forest. USFS Cleveland NF listed (2,000 to 6,560)	Moderate – Known from the vicinity. Suitable habitat present in the project area, and the project area lie within the species' known range.
Linanthus orcuttii	Orcutt's linanthus	None	None	1B.3 FS	Annual herb	May - Jun	Chaparral, lower montane coniferous forests in gravelly clearings, pinyon and juniper woodland. USFS Cleveland NF listed (3,000 to 7,000)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area
Mielichhoferia shevockii	Shevock's copper moss	None	None	1B.2 FS	Moss	N/A	Cismontane woodland (metamorphic, rock, mesic). Occurs in rocks along roads. USFS Cleveland NF listed (2,460 to 4,600)	Low - Known from the vicinity. Marginally suitable habitat present in the sites.
Monardella hypoleuca ssp. intermedia	Intermediate monardella	None	None	1B.3	Perennial herb; rhizomatous	Apr - Sep	Chaparral, cismontane woodland, lower montane coniferous forest (sometimes). Known only from the Santa Ana and Palomar mountains (1,300 to 4,100)	Moderate - Known from the vicinity. Suitable habitat present in the sites.
Monardella hypoleuca ssp. lanata	Felt-leaved monardella	None	None	1B.2 FS	Perennial herb; rhizomatous	Jun - Aug	Chaparral, cismontane woodland. USFS Cleveland NF listed (980 to 5,200)	Unlikely - No known occurrences in the vicinity. Suitable habitat is present in the project area, but the project area lies outside known species' range.
Monardella macrantha ssp. hallii	Hall's monardella	None	None	1B.3 FS	Perennial herb; rhizomatous	Jun - Oct	Broad-leaved upland forests, chaparral, cismontane woodland, lower montane conifer forests, grasslands. USFS Cleveland NF listed (2,400 to 7,200)	High - Known from the vicinity. Suitable habitat present in the project area.
Monardella nana ssp. leptosiphon	San Felipe monardella	None	None	1B.2 FS	Perennial herb; rhizomatous	Jun - Jul	Chaparral, lower montane coniferous forest. USFS Cleveland NF listed (4,000 to 6,100)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Myosurus minimus ssp. apus	Little mousetail	None	None	3.1	Annual herb	Mar - Jun	Vernal pools (alkaline), valley and foothill grassland (65 to 2,100)	Moderate – Known from the vicinity of the project area. Suitable habitat present in the project area, and the project area lie within the species' known range.
Nama stenocarpa	Mud nama	None	None	2B.2	Annual / perennial herb	Jan - Jul	Marshes and swamps (lake margins, riverbanks) (15 to 1,640)	Low - Known from the vicinity. Potential of marginally suitable habitat present in the project area.
Navarretia fossalis	Spreading navarretia	FT	None	1B.1	Annual herb	Apr - Jun	Chenopod scrub, marshes and swamps (assorted shallow freshwater), playas, vernal pools (100 to 2,150)	Low - Known from the vicinity. Marginally suitable habitat present in the project area.
Navarretia peninsularis	Baja navarretia	None	None	1B.2 FS	Annual herb	(May) Jun - Aug	Chaparral openings, lower montane coniferous forest, meadows and seeps. Mesic soils. USFS Cleveland NF listed (4,900 to 7,550)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Navarretia prostrata	Prostrate vernal pool navarretia	None	None	1B.1	Annual herb	Apr - Jul	Coastal scrub, valley and foothill grassland, meadows and seeps, vernal pools, alkaline soils (10 to 4,000)	Moderate - Known from the vicinity of the project area. Suitable habitat present in the project area.
Nolina cismontana	Chaparral nolina	None	None	1B.2 FS	Shrub; evergreen	(Mar) May - Jul	Chaparral, coastal scrub. Sandstone or gabbro soils (460 to 4,200)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Orcuttia californica	California Orcutt grass	FE	SE	1B.1	Annual herb	Apr - Aug	Vernal pools (50 to 2,200)	Moderate - No recorded occurrence within the vicinity of the project area. Suitable habitat is present, and the project area lie within the species' known range.
Packera ganderi	Gander's ragwort	None	SR	1B.2 FS	Perennial herb	Apr - Jun	Chaparral, gabbroic and burn areas. USFS Cleveland NF listed (1,300 to 4,000)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Penstemon californicus	California beardtongue	None	None	1B.2 FS	Perennial herb	May – Jun (Aug)	Chaparral, lower montane coniferous forest, pinyon and juniper woodland/ sandy. USFS Cleveland NF listed (3,800 to 7,550)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Pentachaeta aurea ssp. allenii	Allen's pentachaeta	None	None	1B.1	Annual herb	Mar - Jun	Coastal scrub (openings), valley and foothill grassland. Known from fewer than 20 occurrences in Orange County (250 to 1,700)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Phacelia suaveolens ssp. keckii	Santiago Peak phacelia	None	None	1B.3 FS	Annual herb	May - Jun	Closed-cone coniferous forest, chaparral. Known only from Santa Ana and Tibia Mountains. USFS Cleveland NF listed (1,780 to 5,250)	Moderate – Known from the vicinity of the project area. Suitable habitat present in the project area.
Poa atropurpurea	San Bernardino blue grass	None	None	1B.2 FS	Perennial herb	(Apr) May – Jul (Aug)	Meadows and seeps (4,450 to 8,050)	Unlikely- No recorded occurrence within the vicinity of the project area. No suitable habitat present in the project area.
Pseudognaphalium leucocephalum	White rabbit-tobacco	None	None	2B.2	Perennial herb	(Jul) Aug – Nov (Dec)	Chaparral, cismontane woodland, coastal scrub, riparian woodland (0 to 6,900)	Moderate – Known from the vicinity of the project area. Suitable habitat present in the project area.
Quercus dumosa	Nuttall's scrub oak	None	None	1B.1	Perennial shrub; evergreen	Feb - Apr (May - Aug)	Closed-cone coniferous forest, chaparral, coastal scrub (50 to 1,300)	Low - Known from the vicinity of the project area. Marginally suitable habitat present in the project area.
Quercus engelmannii	Engelmann oak	None	None	4.2	Tree; deciduous	Mar - Jun	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland (165 to 4,300)	Moderate - No recorded occurrence within the vicinity of the project area. Suitable habitat present in the project area, and the project area lies within the species' known range.
Ribes canthariforme	Moreno current	None	None	1B.3 FS	Shrub; deciduous	Feb - Apr	Chaparral, riparian scrub. USFS Cleveland NF listed (1,100 to 4,000)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Romneya coulteri	Coulter's matilija poppy	None	None	4.2	Perennial herb; rhizomatous	May - Jul	Chaparral, coastal scrub, often in burned or disturbed areas (60 to 4,000)	Observed - Observed 2001-2006 during focused surveys.
Scutellaria bolanderi ssp. austromontana	Southern mountains skullcap	None	None	1B.2 FS	Perennial herb; rhizomatous	Jun - Aug	Wet meadows, lower montane coniferous forest, and cismontane woodland. USFS Cleveland NF listed (1,400 to 6,600)	Unlikely - No recorded occurrence within the vicinity of the project area. No suitable habitat in the project area.
Senecio aphanactis	Chaparral ragwort	None	None	2B.2	Annual herb	Jan – Apr (May)	Chaparral, cismontane woodland, coastal scrub (50 to 2,625)	Low - Recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Sibaropsis hammittii	Hammitt's clay-cress	None	None	1B.2 FS	Annual herb	Mar - Apr	Chaparral openings, valley and foothill grasslands. USFS Cleveland NF listed (2,400 to 3,500)	High - Known from the immediate vicinity. Suitable habitat present in the project area.
Sidalcea neomexicana	Salt spring checkerbloom	None	None	2B.2	Perennial herb	Mar - Jun	Chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, playas (15 to 5,000)	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Sphaerocarpos drewei	Bottle liverwort	None	None	1B.1	Ephemeral liverwort	N/A	Chaparral, coastal scrub (290 to 1,970)	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Streptanthus campestris	Southern jewel-flower	None	None	1B.3 FS	Perennial herb	(Apr) May - Jul	Chaparral, lower montane conifer forest, pinyon and juniper woodland/ rocky (3,000 to 7,550)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Symphyotrichum defoliatum	San Bernardino aster	None	None	1B.2	Perennial herb; rhizomatous	Jul - Nov	Meadows and seeps, marshes and swamps, coastal scrub, cismontane woodland, lower montane coniferous forest, grassland, vernally mesic soils. USFS Cleveland NF listed (6 to 6,700)	High - Recorded occurrence in the immediate vicinity of the project area. Suitable habitat present in the project area.
Tetracoccus dioicus	Parry's tetracoccus	None	None	1B.2 FS	Shrub; deciduous	Apr - May	Chaparral, coastal scrub. USFS Cleveland NF listed (440 to 3,300)	High - Known from the vicinity. Suitable habitat present in the project area.
Thermopsis californica var. semota	Velvety false lupine	None	None	1B.2 FS	Perennial herb; rhizomatous	Mar - Jun	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland. USFS Cleveland NF listed (3,300 to 6,150)	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Thysanocarpus rigidus	Rigid fringepod	None	None	1B.2 FS	Annual herb	Feb - May	Pinyon and juniper woodland. Dry rocky slopes. Known from 10 occurrences in CA. USFS Cleveland NF listed (1,950 to 7,200)	Unlikely - No recorded occurrence within the vicinity of the project area. No suitable habitat known in the project area.
Tortula californica	California screw-moss	None	None	1B.2	Moss	N/A	Chenopod scrub, valley and foothill grassland (32 to 4,800)	Low – Known from the vicinity of the project area. Marginally suitable habitat present in the project area.

Species		Status			Life Form	Blooming Period	Habitat Association (elevation range [feet])	Potential for Occurrence in Project Area
Scientific Name	Common Name	USFWS	CDFW	Other				
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	None	None	2B.1	Annual herb	May - Sep	Meadows and seeps, marshes and swamps, riparian forest, vernal pools (15 to 1,430)	Low – Known from the vicinity of the project area. Marginally suitable habitat present in the project area.
Viguiera purisimae	La Purisima viguiera	None	None	2B.3	Shrub	Apr - Sep	Coastal bluff scrub, chaparral. Known from single population at Camp Pendleton (1,120 to 1,400)	Moderate – Known from the vicinity of the project area. Suitable habitat present in the project area.

U.S. FISH AND WILDLIFE SERVICE

FE Federally listed, endangered: species in danger of extinction throughout a significant portion of its range

FT Federally listed, threatened: species likely to become endangered within the foreseeable future

FPE Federally proposed endangered

CALIFORNIA DEPARTMENT OF FISH AND GAME

SE State listed, endangered

ST State listed, threatened

SC California Species of Special Concern: administrative designation for vertebrate species that appear vulnerable to extinction because of declining populations, limited ranges, and/or continuing threats

SP State protected species

SFP Fully protected

CALIFORNIA NATIVE PLANT SOCIETY

List 1B Plants rare, threatened, or endangered in California and elsewhere

List 2 Plants rare, threatened, or endangered in California but more common elsewhere

R Rarity: 1=rare but in sufficient number that extinction potential is low; 2=distribution in a limited number of occurrences; 3=distribution in highly restricted occurrences or present in small numbers

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3.4.5 Special Status Wildlife Species

In the 2007 application document, 45 sensitive wildlife species were determined to have a potential to occur within the Project area. Of these, eleven were designated to have a moderate or high potential, and ten were observed within the proposed Project's boundaries. Special status species that were observed within the Project area from 2001-2006 include two-striped garter snake (*Thamnophis hammondii*), northern red-diamond rattlesnake (*Crotalus ruber ruber*), San Diego horned lizard (*Phrynosoma coronatum blainvillei*), coastal rosy boa (*Lichanura trivirgata*), coastal California newt (Taricha torosa torosa), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), loggerhead shrike (*Lanius ludovicianus*), spotted owl, Cooper's hawk, and California horned lark (*Ermophila alpestris actia*).

From 2001-2006, surveys were performed for five several listed wildlife species including: Arroyo toad, QBC, CGN, least Bell's vireo (LBV), and southwestern willow flycatcher (SWF). All five species have moderate-to-high potential to occur based on the habitats present and the facilities' location in designated critical habitat (for the QCB and CGN). Surveys included: six consecutive years of QCB surveys, four years for arroyo toad surveys, and six consecutive years of coastal CGN, LBV, and SWF surveys. During these multi-year surveys, none of these species were observed within or adjacent to the study area. See Figures E.3-8 - E.3-12 for maps of these areas.[18]

[18]/ Note: These figures illustrate the range of transmission alignments considered in the FERC FEIS and the location of those focused wildlife surveys conducted in association with those alignments. With the exception of the proposed Project alignment identified in this Exhibit, the transmission alignments depicted herein are not being proposed by the Applicant and are not being presented for FERC's consideration.

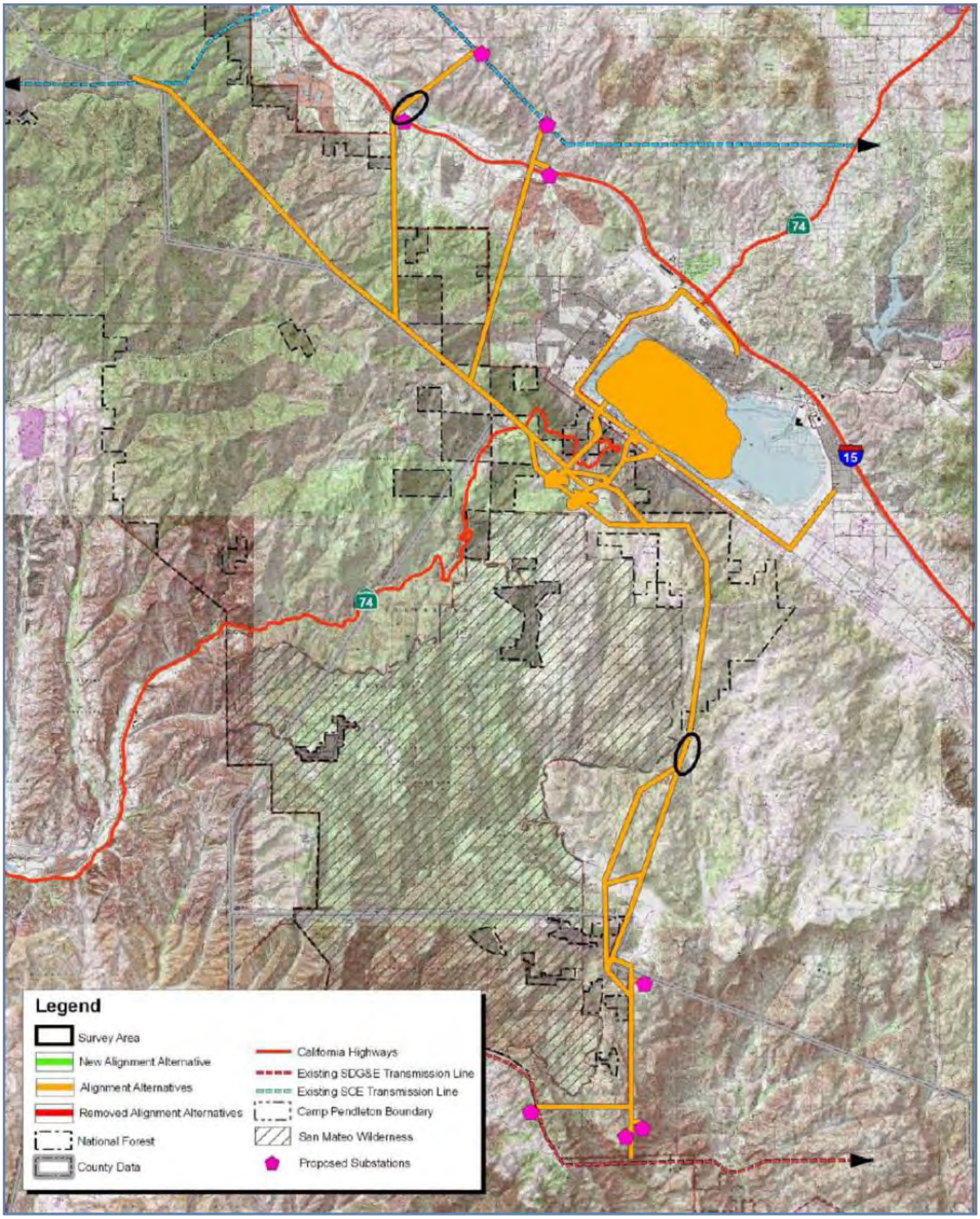

Figure E.3-8: Arroyo Toad Focused Survey Areas
Source: Michael Brandman Associates

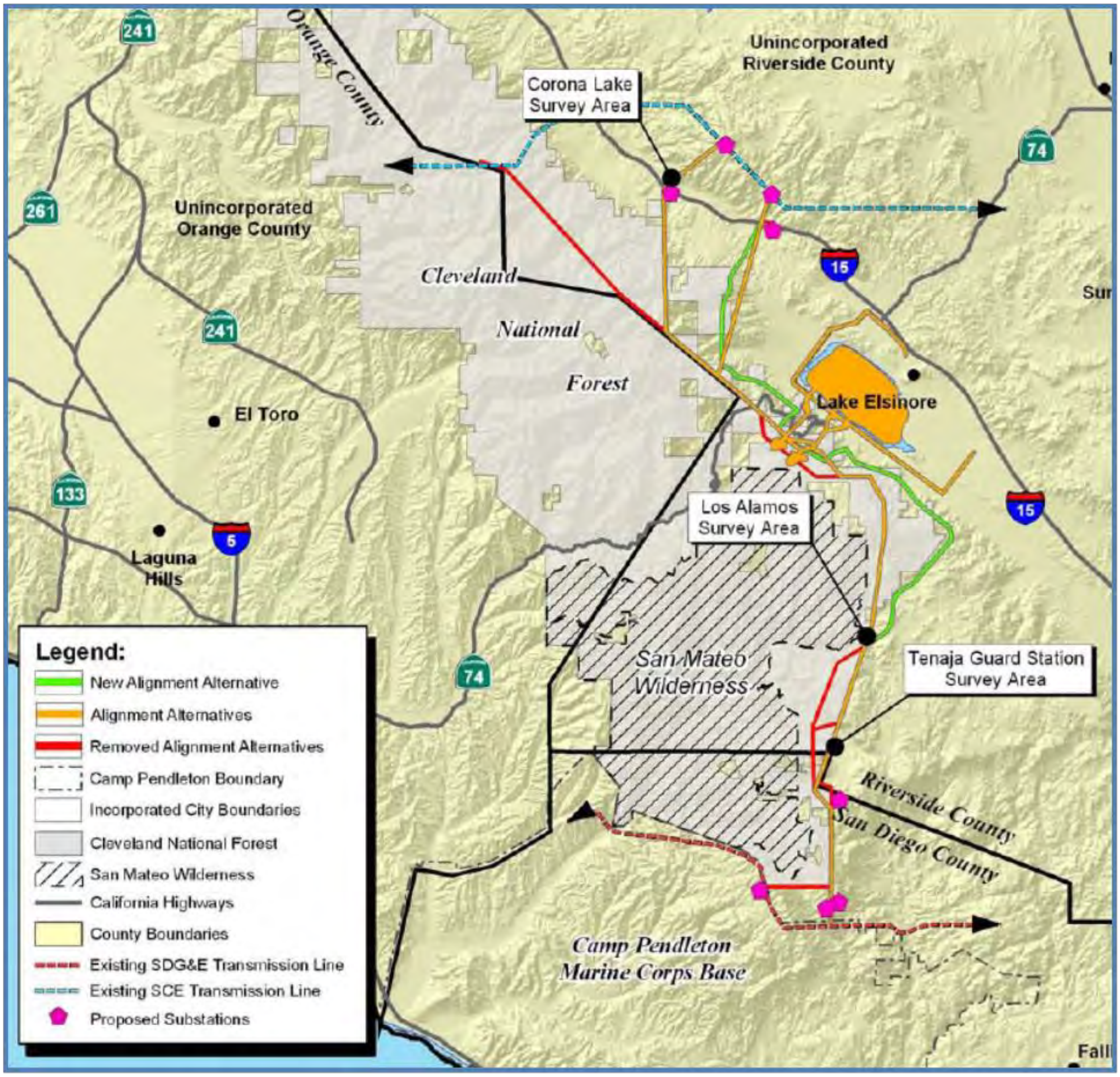

Figure E.3-9: Southwest Willow Flycatcher and Least Bell's Vireo Focused Survey Areas (1 of 2)
Source: Michael Brandman Associates

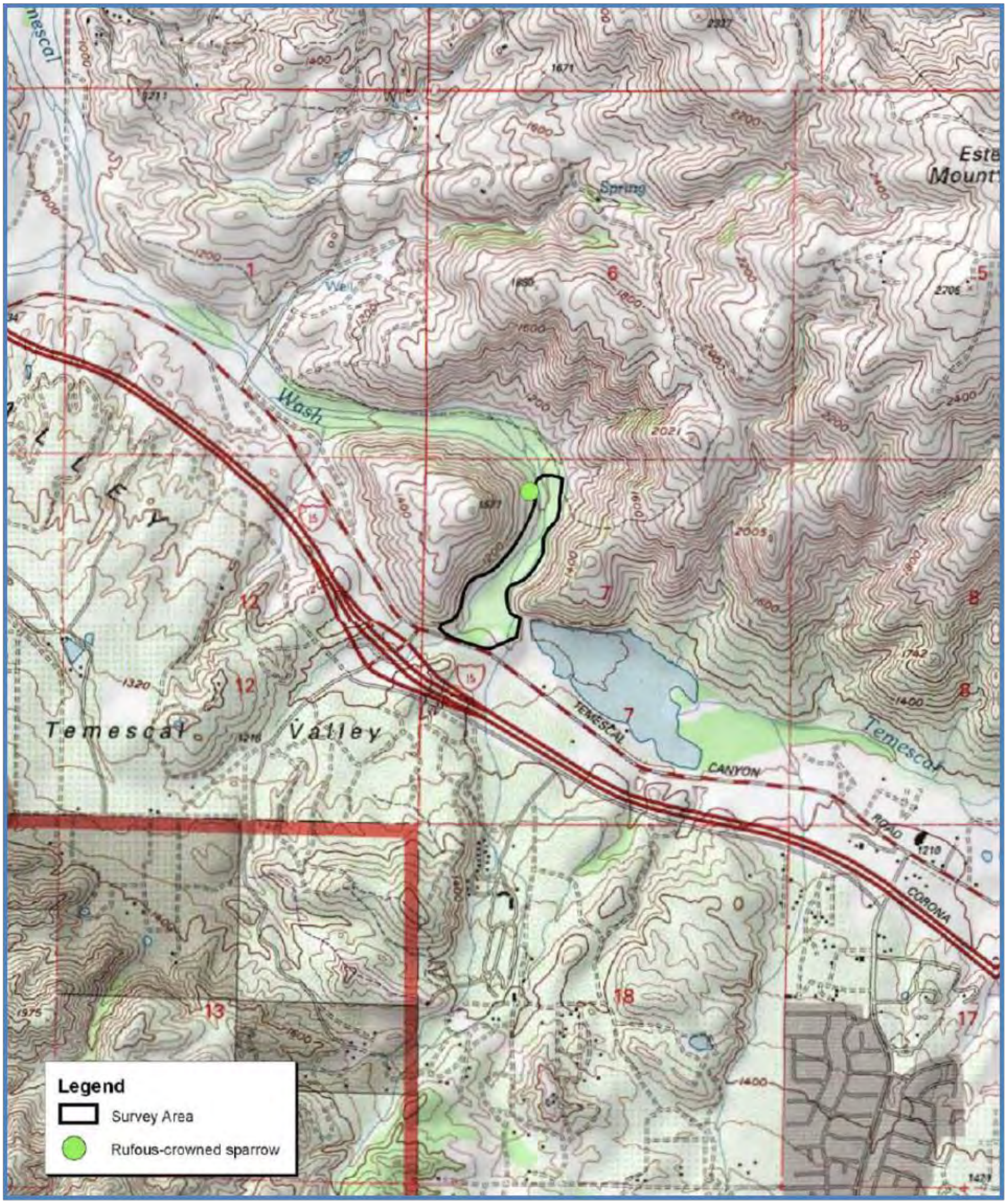

Figure E.3-10:Southwest Willow Flycatcher and Least Bell's Vireo Focused Survey Areas (2 of 2)
Source: Michael Brandman Associates

Based on the updated literature review in September 2017, a total of 62 special status wildlife species were identified as having potential to occur in the project area (excluding those "Unlikely" to occur) based on the updated literature review. Of these, 10 were observed during focal studies conducted between 2001 and 2006, and were known to occur within the project area:

- Coast Range newt (*Taricha torosa torosa*)
- Northern red-diamond rattlesnake (*Crotalus ruber ruber*)
- Rosy boa (*Lichanura trivirgata*)
- San Diego horned lizard (*Phrynosoma coronatum blainvillei*)
- Two-striped garter snake (*Thamnophis hammondii*)
- Cooper's hawk (*Accipiter cooperii*)
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)
- California horned lark (*Eremophila alpestris actia*)
- Loggerhead shrike (*Lanius ludovicianus*)
- California spotted owl (*Strix occidentalis occidentalis*)

An additional 32 special status wildlife species have been identified as having moderate or high potential to occur in the project area, though occurrences have not been recorded, and may be impacted by project development. These species are identified in Table E.3-14, and include 22 species that were previously identified as having moderate or high potential to occur. The following 10 species were not previously identified as having moderate or high potential to occur, but are reasonably probable to occur based on the updated literature review:

- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- San Diego fairy shrimp (*Branchinecta sandiegonensis*)
- California glossy snake (*Arizona elegans occidentalis*)
- San Diegan tiger whiptail (*Aspidoscelis tigris stejnegeri*)
- San Diego banded gecko (*Coleonyx variegatus abbotti*)
- Blainsville's horned lizard (*Phrynosoma blainvillii*)
- Osprey (Pandion haliaetus)
- White-faced ibis (*Plegadis chihi*)
- Western mastiff bat (*Eumops perotis californicus*)
- Pacific pocket mouse (*Perognathus longimembris pacificus*)

Table E.3-14:Special-Status Wildlife Species with Potential to Occur in Pump Hydro Storage Project Area

Species		Status			Distribution	Required Habitat	Known Presence/Potential Habitat/Potential in Project area
Scientific Name	Common Name	USFWS	CDFW	Other			
Invertebrates							
Branchinecta lynchi	Vernal pool fairy shrimp	FT	None	None	Endemic to CA and OR	Vernal pools; other seasonal wetlands or pools that dry in summer	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Branchinecta sandiegonensis	San Diego fairy shrimp	FE	None	None	Known between Santa Barbara, CA and NW Baja California, Mexico. Primarily in San Diego County, CA	Vernal pools; other seasonal wetlands or pools that dry in summer	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Euphydryas editha quino	Quino checkerspot butterfly	FE	None	None	SW CA into NW Baja California, Mexico	Sparsely vegetated sage scrub/grassland mix with dwarf plantain and/or purple owl's clover	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area. Fires from 2010 and 2013 burned approximately 3 miles of proposed transmission line rights-of-way approximately 4 miles west of known populations (CALFIRE 2017), representing potential new habitat.
Lyceana hermes	Hermes copper butterfly	FC	None	FS	San Diego County, CA and adjacent Baja California Norte, Mexico. USFS Cleveland NF listed	Mixed woodlands, chaparral, and coastal sage scrub	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Rothelix warnerfontis	Warner Spring shoulderbank snail	None	None	FS	Known from the type locality and a small population in a ravine just below Lost Valley Spring. USFS Cleveland NF listed	Abandoned wood rat nests at the type locality, and fallen logs and leaf mold of Quercus agrifolia	Unlikely - No recorded occurrence within the vicinity of the project area. No suitable habitat present in the project area.
Streptocephalus woottoni	Riverside fairy shrimp	FE	None	None	Endemic to Riverside and San Diego, CA	Tectonic swales/earth slump in grassland and coastal sage scrub	Unlikely - Not known from the vicinity. No suitable habitat in the project area.
Fish							
Eucyclogobius newberryi	Tidewater goby	FE	CSC	None	Del Norte County to San Diego County, CA. Endemic to CA	Coastal lagoons, estuaries, and marshes	Unlikely - Recorded occurrence in vicinity of the project area. No suitable habitat known to be present in the project area.
Gila orcutti	Arroyo chub	None	CSC	FS	Los Angeles, CA. USFS Cleveland NF listed	South coastal streams	Unlikely - Not known from the vicinity. No suitable habitat in the project area.

Species		Status			Distribution	Required Habitat	Known Presence/Potential Habitat/Potential in Project area
Scientific Name	Common Name	USFWS	CDFW	Other			
Oncorhynchus mykiss irideus	Steelhead (southern California DPS)	FE	None	None	From the Santa Maria River to the Tijuana River at the US/Mexico border, in seasonally accessible rivers and streams	Migrate from marine environments to freshwater; gravel-bottomed, well oxygenated river and streams; feed primarily on zooplankton	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Oncorhynchus (=Salmo) mykiss irideus	Steelhead (Central Valley DPS)	FT	None	None	All naturally spawned populations in the Sacramento and San Joaquin rivers, and their tributaries	Migrate from marine environments to freshwater; gravel-bottomed, well oxygenated river and streams; feed primarily on zooplankton	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Rhinichthys osculus ssp. 3	Santa Ana speckled dace	None	CSC	FS	West of continental divide from South British Columbia south to southern AZ. USFS Cleveland NF listed	Cool to warm creeks, rivers, and lakes, over gravel or rock: desert springs and their outflow	Unlikely - Not known from the vicinity. No suitable habitat in the project area.
Amphibians							
Anaxyrus californicus	Arroyo toad	FE	CSC	None	SW CA into northwestern Baja California, Mexico	Streams and arroyos, sandy banks	Low – Known from the vicinity. Marginally suitable habitat present in the project area.
Ensatina (eschscholtzii) klauberi	Large-blotched salamander	None	WL	FS	Mountainous areas northeast of San Diego, CA	Deciduous, evergreen forests, oak woodland, and chaparral	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Rana draytonii	California red-legged frog	FT	CSC	None	West of Sierra Nevada, CA to northern Baja California, Mexico	Ponds, or permanent water ways with extensive vegetation	Low - No recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.

Species		Status			Distribution	Required Habitat	Known Presence/Potential Habitat/Potential in Project area
Scientific Name	Common Name	USFWS	CDFW	Other			
Rana muscosa	Southern mountain yellow-legged frog	FE	CE	FS	Sierra Nevada, CA. North of Feather River Mountains of southern CA from Pacoima Ridge south at 1,200-7,500 feet with the southernmost population being isolated on Mt Palomar	Requires sunny riverbanks, meadow streams, isolated pools, and lake borders in the high sierra NV and rocky stream courses in the mountains of southern CA	Unlikely - Not known from the vicinity. No suitable habitat in the project area.
Spea hammondii	Western spadefoot	None	CSC	BLM	NW CA to NW Baja California, Mexico	Washes, floodplains, alluvial fans, playas, and alkali flats	High - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Taricha torosa	Coast Range newt	None	CSC	None	Mendocino County to San Diego County, CA	Coastal drainages; breeds in ponds, reservoirs, and slow moving streams	Low - Observed 2001-2006 during focused surveys of the entire project area. Marginally suitable habitat present in the project area.
Reptiles							
Anniella pulchra	Northern California legless lizard	None	CSC	FS	From near Antioch, CA south in Coast Ranges, Transverse mountains, and Peninsular Range into northwest. Baja California, Mexico. USFS Cleveland FS listed	Moist sandy loams near sparse vegetation	Unlikely – Recorded occurrence in vicinity of the project area. No suitable habitat in the project area
Arizona elegans occidentalis	California glossy snake	None	None	SSC	Eastern part of San Francisco Bay, CA, south to NW Baja California, Mexico	Arid scrub, rocky washes, grassland, chaparral	Moderate - No recorded occurrence within the vicinity of the project area. Suitable habitat present in the project area.
Aspidoscelis hyperythra (beldingi)	(Belding's) orange-throated whiptail	None	WL	FS	SW CA to Baja California, Mexico. USFS Cleveland NS listed	Chaparral/ semiarid areas, frequently where loose sand/soil is present	High - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area
Aspidoscelis tigris stejnegeri	San Diegan tiger whiptail	None	CSC	None	Coastal southern CA, west of the Peninsular Range and south of the Tranverse Range	Hot and dry open areas with sparse vegetation. Chaparral, woodland, and riparian areas	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.

Species		Status			Distribution	Required Habitat	Known Presence/Potential Habitat/Potential in Project area
Scientific Name	Common Name	USFWS	CDFW	Other			
Coleonyx variegatus abbotti	San Diego banded gecko	None	CSC	None	Coastal southern CA, south into Baja California, Mexico to just north of the Viscaino Desert	Rocky areas in coastal sage and chaparral	Low - Recorded occurrence in vicinity of the project area. Marginally suitable habitat present in the project area.
Crotalus ruber	Northern red-diamond rattlesnake	None	CSC	FS	SW CA to Baja California, Mexico. USFS Cleveland NF listed	Chaparral, desert scrub, rocky alluvial fans	Moderate - Observed 2001-2006 during focused surveys of the entire project area. Suitable habitat present in the project area.
Diadophis punctatus similis	San Diego ringneck snake	None	None	FS	SW CA to Baja California, Mexico. USFS Cleveland NF listed	Rocky areas, flat rocks, woodpiles, stable talus small ground holes	Moderate - No recorded occurrence within the vicinity of the project area. Potentially suitable habitat present in the project area.
Emys marmorata	Western pond turtle	None	CSC	FS, BLM	West of Sierra-Cascade crest, Mojave Desert to 6,000 feet. USFS Cleveland NF listed	Permanent, or nearly permanent, fresh water areas	Moderate - No recorded occurrence within the vicinity of the project area. Potentially suitable habitat present in the project area.
Lampropeltis zonata (pulchra)	California mountain kingsnake (San Diego population)	None	CSC	FS; BLM	Southern WA to northern Baja California, Mexico. Mountains of coastal and interior CA, except desert. USFS Cleveland NF listed	Moist woods, coniferous forest, woodland, and chaparral. Ranging from sea level high into the mountains	Moderate - No recorded occurrence within the vicinity of the project area. Potentially suitable habitat present in the project area.
Lichanura trivirgata	Rosy boa	None	None	FS, BLM	Coastal southern CA to Baja California, Mexico	Rocky shrub lands and desert	Moderate - Observed 2001-2006 during focused surveys of the entire project area. Potentially suitable habitat present in the project area.
Phrynosoma blainvillii	Blainsville's horned lizard	None	SSC	BLM	Baja California, Mexico border west of the deserts and the Sierra Nevada, north to the Bay Area, and inland as far north as Shasta Reservoir	Open areas of sandy soil and low vegetation in valleys, foothills and semiarid mountains. Grasslands, coniferous forests, woodlands, and chaparral	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Phrynosoma coronatum blainvillei	San Diego horned lizard	None	CSC	FS	Coast of CA from Los Angeles to Baja California, Mexico	Sandy soil with low vegetation	Moderate - Observed 2001-2006 during focused surveys of the entire project area. Potentially suitable habitat present in the project area.

Species		Status			Distribution	Required Habitat	Known Presence/Potential Habitat/Potential in Project area
Scientific Name	Common Name	USFWS	CDFW	Other			
Plestiodon skiltonianus interparietalis	Coronado skink	None	WL	BLM	SW CA to Baja California, Mexico	Chaparral, rocky habitats near streams	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Thamnophis hammondii	Two-striped garter snake	None	CSC	FS, BLM	Coastal CA to NW Baja California, Mexico. USFS Cleveland NF listed	Permanent fresh water, along stream with rocky bed bordered by willows or riparian growth	Moderate - Observed 2001-2006 during focused surveys of the entire project area. Potentially suitable habitat present in the project area dependent on growth of human population surrounding lake and tributaries.
Birds							
Accipiter cooperii	Cooper's hawk	None	WL	None	Southern Canada to northern Mexico	Mature forest, open woodlands, river groves	Moderate - Observed 2001-2006 during focused surveys of the entire project area. Potentially suitable habitat present in the project area.
Agelaius tricolor	Tricolored blackbird	None	Candidate SE; CSC	BCC	Valleys and foothills of Central CA, to Kern County and the coastal slope with Mexico	Freshwater marshes dominated by cattails and tule, with some willow and/or nettle	Low – Recorded occurrence within vicinity of the project area. Marginally suitable habitat potentially present in the project area.
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	None	WL	None	Bay area, CA to Baja, Mexico	Coastal sage scrub, chaparral	Moderate - Observed 2001-2006 during focused surveys of the entire project area. Potentially suitable habitat present in the project area.
Aquila chrysaetos	Golden eagle	None	CSC, SFP, WL	BCC, BLM	Throughout Asia, northern Africa, and in North America	Prefer semi-open to open habitats including tundra, shrublands, grasslands, and woodlands. Also occur in more mesic locations	Moderate – Recorded occurrence within vicinity of the project area. Potentially suitable habitat potentially present in the project area.
Asio otus	Long-eared owl	None	CSC	None	Southern Canada to northern Mexico	Riparian bottomlands, belts of live oak	Moderate - No recorded occurrence within the vicinity of the project area. Potentially suitable habitat present in the project area.
Atemisiospiza belli	Bell's sage sparrow	None	WL	BCC	Northern US to Mexico	Nests in chaparral dominated by fairly dense stands of chamise, coastal sage scrub in southern portion of range	Low - Recorded occurrence within vicinity of the project area. Marginally suitable habitat present in the project area.

Species		Status			Distribution	Required Habitat	Known Presence/Potential Habitat/Potential in Project area
Scientific Name	Common Name	USFWS	CDFW	Other			
Athene cunicularia	Burrowing owl	None	CSC	BLM	Southern Canada to Mexico	Grasslands, shrublands with low-growing cover	Moderate - Recorded occurrence in vicinity of the project area. Potentially suitable habitat present in the project area.
Buteo swainsoni	Swainson's hawk	None	ST	BCC, BLM	Most common in the Great Plains. Nesting range has declined in CA	Plains, dry grasslands, farmland, ranchland	Low - Recorded occurrence within the vicinity of the project area. Suitable habitat present in the project area, but project area is likely out of the species range.
Campylorhynchus brunneicapillus sandiegensis	San Diego cactus wren	None	CSC	FS	SW US to central Mexico. USFS Cleveland NF listed	Coastal sage scrub associated with cactus patches	Unlikely - No recorded occurrence within the vicinity of the project area. No suitable habitat present in the project area.
Charadrius alexandrinus nivosus	Western snowy plover	FT	CSC	None	Southern US through central America	Sandy beaches, salt pond levees and large alkali lakes	Unlikely – Recorded occurrence in vicinity of the project area. No suitable habitat in the project area.
Circus cyaneus	Northern harrier	None	CSC	None	Modoc Plateau to San Diego, CA	Marshes, fields, and prairies with a preference towards marshes	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	FC	SE	FS	Common in eastern U.S. Limited distribution in the west. Winters in South America. USFS Cleveland NF listed	Riparian forest nester, along the broad, lower flood- bottoms of larger river systems. Dense willow jungles with cottonwoods	Low – Recorded occurrence of transients in vicinity of the project area. Suitable habitat present in the project area, but project area is likely out of the species' known range.
Elanus leucurus	White-tailed kite	None	SFP	None	South coastal range of CA, to south Texas to eastern Mexico	Open savanna, grasslands, and fields	Moderate - Recorded occurrence in vicinity of the project area. Potentially suitable habitat present in the project area.
Empidonax traillii extimus	Southwestern willow flycatcher	FE	None	None	Alaska, Canada to SW US	Drier willow thickets, alders	Moderate - Recorded occurrence in vicinity of the project area. Potentially suitable foraging habitat present in the project area.
Eremophila alpestris actia	California horned lark	None	CSC	None	CA	Short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats	Low - Observed 2001-2006 during focused surveys of the entire project area. Marginally suitable habitat present in the project area.
Falco peregrinus anatum	American peregrine falcon	Delisted	SFP	BCC	Found throughout the US. Pacific Coast from Mexico north to Alaska and the Arctic tundra	Mountain ranges, river valleys, and coastlines	Low - Recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.

Species		Status			Distribution	Required Habitat	Known Presence/Potential Habitat/Potential in Project area
Scientific Name	Common Name	USFWS	CDFW	Other			
Haliaeetus leucocephalus	Bald eagle	FT (FPD)	SE, SFP	FS	Alaska, Canada to SW US. USFS Cleveland NF listed	Ocean shorelines, lake margins, river courses	Moderate - Recorded occurrence in vicinity of the project area. Suitable foraging habitat present in the project area.
Icteria virens	Yellow-breasted chat	None	CSC	None	Canada to Mexico	Riparian thickets near watercourses	High - Observed within Temescal Wash. Suitable habitat present in the project area.
Lanius ludovicianus	Loggerhead shrike	None	CSC	None	Canada to Mexico	Grasslands, coastal sage scrub, chaparral	Moderate - Observed 2001-2006 during focused surveys of the entire project area. Suitable habitat within the project area.
Pandion haliaetus	Osprey	None	None	WL	Found on all continents except for Antarctica	Primary requirement is a waterbody containing an adequate source of fish	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Passerculus sandwichensiss rostratus	Belding's savannah sparrow	None	SE	None	Widely breeds across northern and central America. Winters in Baja	Coastal marshes and beaches	Unlikely – Recorded occurrence in vicinity of the project area. No suitable habitat in the project area.
Pelecanus erythrorhynchos	American white pelican	None	CSC	None	Throughout US	Brackish and freshwater lakes of inland US	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Pelecanus occidentalis	Brown pelican	None	None	FS	Southern and western US sea coasts. Rarely found inland except at the Salton Sea. USFS Cleveland NF listed	Feed by diving into the ocean. Nest in secluded areas including sand dunes, mangroves, shrubs and thickets. Rarely found inland	Unlikely - Not known from the vicinity. No suitable habitat in the project area.
Plegadis chihi	White-faced ibis	None	None	WL	Utilizes discontinuous marshes in the west. Utilizes the Great Basin and overwinters as large flocks in Mexico	Shallowly flooded pond margins, reservoirs, and marshes. Will use agricultural fields	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Polioptila californica	Coastal California gnatcatcher	FT	CSC	None	SE CA to Baja California, Mexico	Coastal scrub, dry washes, ravines	Unlikely - Recorded occurrence in vicinity of the project area. No suitable habitat present in the project area.

Species		Status			Distribution	Required Habitat	Known Presence/Potential Habitat/Potential in Project area
Scientific Name	Common Name	USFWS	CDFW	Other			
Setophaga petechia	Yellow warbler	None	CSC	BCC	Entirety of North America, down to northern South America	Breed in thickets along streams and wetlands. Winter in mangrove forests, dry scrub, marshes and forests	Low - Recorded occurrence within the vicinity of the project area. Marginally suitable habitat present in the project area.
Sterna antillarum browni	California least tern	FE	SE, SFP	None	Pacific Coast from San Francisco, CA to Baja California, Mexico	Nest on open beaches kept free from vegetation	Unlikely – Recorded occurrence in vicinity of the project area. No suitable habitat in the project area.
Strix occidentalis	California spotted owl	None	CSC	FS, BLM	Southern Canada to Mexico. USFS Cleveland NF listed	Coniferous forests, wooded canyons	Low - Observed 2001-2006 during focused surveys of the entire project area. Marginally suitable habitat present in the project area.
Vireo bellii pusillus	Least Bell's vireo	FE	SE	None	Southern coastal ranges of CA through Mexico	Riparian areas, forest edges	Low - Recorded occurrence within the project area. Marginally suitable habitat present in the project area.
Vireo vicinior	Gray vireo	None	CSC	FS, BLM	Summers in the Great Basin and overwinters in NW Mexico. USFS Cleveland NF listed	Desert scrub, mixed juniper or pinyon pine, oak scrub associations, chaparral	Low - No recorded occurrence within the vicinity of the project area. Suitable habitat present in the project area, but project area is likely out of the species' known range.
Mammals							
Antrozous pallidus	Pallid bat	None	CSC	FS	SW US into northern Baja, Mexico, and western states. USFS Cleveland NF listed	Caves, tunnels, mines, crevices in rock used for roosts	Low - Recorded occurrence in vicinity of the project area. No suitable habitat in the project area.
Chaetodipus fallax	Northwestern San Diego pocket mouse	None	CSC	None	Western San Diego, CA	Coastal scrub, chaparral, grasslands, sagebrush	Moderate - Recorded occurrence in vicinity of the project area. Suitable habitat present in the project area.
Corynorhinus townsendi	Townsend's big-eared bat	None	CSC	FS, BLM	Western US, into central Mexico. USFS Cleveland NF listed	Caves, mines, tunnels for roosts	Unlikely - Not known from the vicinity. No suitable habitat in the project area.
Dipodomys merriami parvus	San Bernardino Merriam's kangaroo rat	FE	CSC	None	Seven locations within San Bernardino and Riverside Counties, CA	Alluvial scrub/coastal sage scrub habitats on gravelly and sandy soils adjoining river and stream terraces, and on alluvial fans	Unlikely - Not known from the vicinity. No suitable habitat in the project area.

Species		**Status**			**Distribution**	**Required Habitat**	**Known Presence/Potential Habitat/Potential in Project area**
Scientific Name	**Common Name**	**USFWS**	**CDFW**	**Other**			
Dipodomys stephensi	Stephens' kangaroo rat	FE	ST	None	Riverside County south to San Diego County, CA	Annual and perennial grassland, coastal scrub or sagebrush scrub	Moderate - Recorded occurrence in the northern 3 miles of the project area, including 6 new survey results recorded 2008-2011. Suitable habitat present in the project area.
Eumops perotis californicus	Western mastiff bat	None	None	SSC	SW CA to Central Mexico.	Rock features with roosting locations. Forage in open forest and grassland habitats	Low – Recorded occurrences in vicinity of the project area. No suitable habitat observed in the project area.
Lasiurus blossevillii	Western red bat	None	None	FS	Most of CA, south into Baja Mexico	Wooded areas, roosts in trees	Moderate - Recorded occurrence in vicinity of the project area. Potentially suitable habitat present in the project area.
Lepus californicus bennetii	San Diego black-tailed jackrabbit	None	CSC	None	SW CA	Coastal sage scrub habitat	Unlikely - Recorded occurrence in vicinity of the project area. No suitable habitat present in the project area.
Myotis thysanodes	Fringed myotis	None	None	FS, BLM	Widespread across CA. USFS Cleveland NF listed	Ideal would be pinyon juniper, valley foothill hardwood, and hardwood conifer at 4,000 to 7,000 feet in elevation	Unlikely- Not known from the vicinity. No suitable habitat in the project area.
Nyctinomops femorosaccus	Pocketed free-tailed bat	None	CSC	None	Riverside, San Diego, and Imperial Counties, CA. More common in Mexico	Rock desert crevices in cliffs as roosting project area. Drop from roost to gain speed	Low – Recorded occurrences in vicinity of the project area. No suitable habitat observed in the project area.
Perognathus longimembris brevinasus	Los Angeles little pocket mouse	None	CSC	FS	Burbank and San Fernando on the NW, to San Bernardino on the NE, and Cabazon, Hemet and Aguanga on the east and SE	Grassland and coastal scrub	Unlikely – Recorded occurrence in vicinity of the project area. No suitable habitat in the project area.
Perognathus longimembris pacificus	Pacific pocket mouse	FE	CSC	None	Arid regions from Baja California to Sonora, Mexico	Coastal sage scrub habitat	Unlikely – No recorded occurrences in vicinity of the project area. No suitable habitat in the project area.

U.S. FISH AND WILDLIFE SERVICE

FE Federally listed, endangered: species in danger of extinction throughout a significant portion of its range

FT Federally listed, threatened: species likely to become endangered within the foreseeable future

FPE Federally proposed endangered

Species		Status			Distribution	Required Habitat	Known Presence/Potential Habitat/Potential in Project area
Scientific Name	Common Name	USFWS	CDFW	Other			

BCC Bird of Conservation Concern

CALIFORNIA DEPARTMENT OF FISH AND GAME

SE State listed, endangered

ST State listed, threatened

SC California Species of Special Concern: administrative designation for vertebrate species that appear vulnerable to extinction because of declining populations, limited ranges, and/or continuing threats

SP State protected species

SFP Fully protected

CALIFORNIA NATIVE PLANT SOCIETY

List 1B Plants rare, threatened, or endangered in California and elsewhere

List 2 Plants rare, threatened, or endangered in California but more common elsewhere

R Rarity: 1=rare but in sufficient number that extinction potential is low; 2=distribution in a limited number of occurrences; 3=distribution in highly restricted occurrences or present in small numbers

3.4.6 Potential Impacts to Existing RTE or Sensitive Species

3.4.6.1 Construction impacts to RTE or Sensitive Species

Impact BR-7: Construction activities would result in direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife.

Listed or sensitive (special status) wildlife species impacts could result from direct or indirect loss of known locations of individuals or direct loss of potential habitat as a result of temporary or permanent grading or vegetation clearing during construction of the Project components. In addition, individuals near construction areas may temporarily abandon their territories due to disturbance from noise and human activity. A number of non-listed, sensitive wildlife species have the potential to occur in these areas.

Multiple years of surveys for the listed CGN were negative. These species are not present and, as a result of their absence, would not be impacted by Project construction or operation. The SKR is assumed to exist in the area of the associated interconnect but is not present in the area of the Project Powerhouse, Decker Canyon Reservoir, or within the OHWM of Lake Elsinore.

Impact BR-7-SKR: Direct or indirect loss of Stephens' kangaroo rat or direct loss of habitat. The SKR is assumed to exist in the area of the associated interconnect but is not present in the area of the Project Powerhouse, Decker Canyon Reservoir, or within the OHWM of Lake Elsinore. Potential SKR habitat (non-native grassland) is present in the area of the Lake Switchyard. Based on the presence of an existing in-lieu fee program (SKR Fee Assessment Area), the SKR was assumed to be present in that area. As proposed, the Lake Switchyard is part of an interconnected facility. As such, Project construction and operation will not directly or indirectly impact this species.

In accordance with Significance Criteria 1.a (Substantial adverse effect, either directly or indirectly, on one or more individuals of a federal or State-listed species), cumulative impacts to the SKR, inclusive of both Project and its primary connection, would be significant and not likely mitigable to a less-than-significant level because adequate suitable lands required for the SKR may not be available to compensate for direct and indirect impacts to that species. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

PMEs BR-7e and BR-7f are recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to the SKR.

Impact BR-5: Construction activities would result in direct or indirect loss of listed or sensitive plants or a direct loss of habitat for listed or sensitive plants. Although four special status plant species were documented in the general area during six previous years of surveys, no special status plants were observed at the locations of Project facilities. As a result of their absence, there would be no impacts to special status plant species from construction of the Project components.

Impact BR-11: Presence of transmission lines would result in increased predation of listed and sensitive wildlife species by ravens that nest on transmission towers. The common raven has not been documented to prey on any listed or sensitive wildlife present along the primary connection (Liebezeit et al., 2002). Although predation may occur on a limited basis, the impacts would be adverse but less than significant.

Table E.3-15:Primary Transmission Lines /Talega-Escondido Upgrades – Biological Resource Impacts

Impact	Description
BR-1	Construction activities would result in temporary and permanent losses of native vegetation.
BR-2	Construction activities would result in adverse effects to jurisdictional waters and wetlands through vegetation removal, placement of fill, erosion, sedimentation, and degradation of water quality.
BR-3	Construction and operation/maintenance activities would result in the introduction of invasive, non-native, or noxious plant species.
BR-4	Construction activities would create dust that would result in degradation of vegetation.
BR-5	Construction activities would result in direct or indirect loss of listed or sensitive plants or a direct loss of habitat for listed or sensitive plants.
BR-6	Construction, including the use of access roads, would result in disturbance to wildlife and result in wildlife mortality.
BR-7	Construction activities would result in direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife.
BR-8	Construction activities would result in a potential loss of nesting birds (violation of the Migratory Bird Treaty Act).
BR-9	Construction or operational activities would adversely affect linkages or wildlife movement corridors, the movement of fish, and/or native wildlife nursery sites.
BR-10	Presence of transmission lines may result in electrocution of, and/or collisions by, listed or sensitive bird species.
BR-11	Presence of transmission lines may result in increased predation of listed and sensitive wildlife species by ravens that nest on transmission towers.
BR-12	Maintenance activities would result in disturbance to wildlife and could result in wildlife mortality.

Impact BR-5: Construction activities would result in direct or indirect loss of listed or sensitive plants or a direct loss of habitat for listed or sensitive plants. Two listed (Munz's onion and thread-leaved brodiaea) and six non-listed, sensitive (matilija poppy, Rainbow manzanita, Hammitt's claycress, Orcutt's brodiaea, matilija poppy, and heart-leaved pitcher sage) plant species were documented along or near the route of the primary connection. The Munz's onion was observed near the route, and its designated critical habitat is, at its closest, approximately 125 feet west of the route tower location south of the I-15 Freeway. Munz's onion and its critical habitat are not anticipated to be impacted by construction of the primary connection unless its critical habitat is removed or damaged (by being driven over) during tower construction. As indicated in the FEIS, no impacts to Munz's onion are anticipated as a result of the proposed construction and operation.

Thread-leaved brodiaea was observed immediately west of the primary transmission line right-of-way at MP 21.5, but was not observed within the construction footprint. A population of this plant was also observed within one of the proposed additional work space areas at MP 28.4. Another proposed additional work space area at MP 27 contains suitable habitat, but was not evaluated due to private property access issues. This species has a high potential to occur on the site based on suitable habitat and close occurrence of known populations.

Should a direct or indirect impact to Munz's onions or thread-leaved brodiaea occurs during construction, under Significance Criteria 1.a (Any impact to one or more individuals of a species that is federal or State listed as endangered or threatened), Significance Criteria 1.b (Any impact that would affect the number or range or regional long-term survival of a sensitive or special status plant species), and/or Significant Criteria 1.d (Disturbance of designated critical habitat), the resulting impact would be deemed significant and not likely mitigable to a less-than-significant level.

Although the resulting impact is likely to remain significant, PMEs BR-5a through BR-5d, in combination with PMEs BR-1a, BR-1c, BR-1d, and BR-1f, and are recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to special status plant species.

Impact BR-7: Construction activities would result in direct or indirect loss of listed or sensitive wildlife or a direct loss of habitat for listed or sensitive wildlife. Impacts to listed or sensitive (special status) wildlife species impacts could result from direct or indirect loss of known locations of individuals or the direct loss of potential habitat as a result of temporary or permanent grading or vegetation clearing during construction of the Talega-Escondido upgrades. In addition, individual species near construction areas may temporarily abandon their territories due to disturbance from noise and human activity. Those listed and non-listed, sensitive wildlife species having a moderate-to-high potential to occur in these areas include the LBV, SWF, QCB, arroyo toad, SKR, CGN, and RFS. The highly sensitive golden eagle is known to nest near the primary transmission line corridor. Impacts to these species are addressed below.

Most of the non-listed, sensitive species' habitats are sensitive vegetation communities. The mitigation for the loss of the sensitive vegetation communities (PME BR-1a) would normally compensate for the potential loss of these sensitive species and their habitats. Since adequate suitable lands required by PME BR-1a may not be available, an impact to non-listed, sensitive wildlife species could be significant according to Significance Criteria 2.a (Impacts that directly or indirectly cause the mortality of candidate, sensitive, or special status wildlife species) and not likely mitigable to a less-than-significant level. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

PMEs BR-7a through BR-7h, in combination with PMEs BR-1a through BR-1h, and BR-2a through BR-2c, are recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to non-listed, sensitive wildlife species.

Those sensitive wildlife species with a potential to occur along the route of the Talega-Escondido upgrade include LBV, SWF, golden eagle, QCB, arroyo toad, SKR, CGN, and RFS. These species are addressed below under Impacts BR-7-LBV, BR-7-SWR, BR-7-GE, BR-7-QCB, BR-7-AT, BR-7-SKR, BR-7-CGN, and BR-7-RFS, respectively.

Impact BR-7-QCB: Direct or indirect loss of Quino checkerspot butterfly or direct loss of habitat. Surveys for the QCB were conducted for six consecutive years, ending in 2006. No QCB were observed. The nearest reported occurrence of the QCB is approximately five miles away. Although the proposed action would not directly impact the QCB, construction could impact designated critical habitat for the QCB. This impact includes about eight acres in the northern portion of the primary transmission line route north of the I-15 Freeway from approximately 14 transmission towers and several proposed access roads. Since adequate suitable lands required by PME BR-7c may not be available, this impact is significant according to Significance Criteria 1.d (Disturbance of critical habitat) and is likely not mitigable to a less than significant level. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

PME BR-7c is recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to QCB critical habitat.

I**mpact BR-7-SKR: Direct or indirect loss of Stephens' kangaroo rat or direct loss of habitat.** Suitable SKR habitat is present in grasslands and areas of sparse shrub cover along the primary transmission line alignment and at the proposed Lake Switchyard. The SKR is assumed present in these areas. These areas are located within the SKR Fee Assessment Area (approximately 50.2 acres of temporary and permanent impacts), and the northernmost segments of the primary transmission line are located inside the Lake Mathews-Estelle Mountain Core Reserve (approximately 7.6 acres of temporary impact and about 0.4 acres of permanent impact).

As indicated in a "Formal Section 7 Consultation for the Lake Elsinore Advanced Pumped Storage Project (P-11858), Riverside County, California," as prepared by the United States Fish and Wildlife Service (USFWS), dated March 19, 2008, the USFWS states: "For the Stephens' kangaroo rat, the project proponent has indicated that the project will be consistent with the Habitat Conservation Plan for the Stephens' Kangaroo Rat (RCHCA 1996). This will include mitigating permanent and temporary disturbance on a 1:1 basis for areas within the Lake Matthews-Estelle Mountain Core Reserve Area by acquiring additional habitat. This additional habitat will be located in, contiguous with, or directly adjacent to the boundaries of the Lake-Matthews-Estelle Core Reserve Area, to the extent feasible, and the specific area will be subject to the concurrence of the U.S. Fish and Wildlife Service." The USFWS concluded that "no additional Section 7 analysis was necessary for SKR.

Notwithstanding the USFWS' "no jeopardy" findings, direct and indirect impacts to SKR would likely be significant under Significance Criteria 1.a (Substantial adverse effect, either directly or indirectly, on one or more individuals of a federal or State-listed species) and not mitigable to a less-than-significant level because adequate mitigation lands for SKR habitat compensation may not be available. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

PMEs BR-7e and BR-7f are recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to the SKR.

Impact BR-7-CGN: Direct or indirect loss of coastal California gnatcatcher or direct loss of habitat. Suitable habitat for the coastal California gnatcatcher (coastal sage scrub) is located from the I-5 Freeway west into the foothills of the National Forest along the northern portion of the primary transmission line route. Focused surveys for the CGN began in 2001 and have continued for six consecutive years. During those protocol surveys, no CGN were found.

Impacts to approximately 55.1 acres (temporary and permanent impacts) of designated critical habitat for the CGN would occur during construction of the primary connection. Additionally, CGN breeding can be affected by excessive construction noise, considered to be 60 dB(A) Leq at the edge of occupied habitat by the USFWS (USFWS, 2007c; American Institute of Physics, 2005).

Calculations of impacts to critical habitat, as presented herein, are subject to further change and refinement based on additional engineering analyses, continuing biological resource assessment and subsequent agency consultation.

Any impact to coastal CGN-occupied habitat, critical habitat, or to breeding could be potentially significant according to Significance Criteria 1.a (Substantial adverse effect through any impact to one or more individuals of a federal or State-listed species), Significance Criteria 1.d (Disturbance of critical habitat), Significance Criteria 1.g (Substantial adverse effect through activities that result in the killing of migratory birds or destruction or abandonment of migratory bird nests and/or eggs), and/or Significance Criteria 4.d (Adversely affect wildlife through an increase in noise). Direct or indirect impacts to CGN would be mitigable to less-than-significant levels with the implementation of PME BR-7g.

Impact BR-7-LBV: Direct or indirect loss of least Bell's vireo or direct loss of habitat. The least Bell's vireo was observed at MP 1 (Dudek, 2002). Furthermore, designated critical habitat for this species occurs from MPs 24 to 24.5 and from MPs 34.5 to 35. Based on the listed assumptions, the Talega-Escondido upgrades, including other related improvements to the SDG&E and SCE systems, would not directly impact the LBV or LBVI habitat or designated critical habitat (wetland/riparian habitats). Impacts to riparian/wetland habitats would generally be avoided by spanning drainages and through the sensitive siting of access roads in order to avoid or minimize impacts upon those resources.

The 69-kV line upgrade crosses a 100-year and 500-year floodplain directly south of the Pala Substation and a few minor flooding areas exist to the north of the Lilac Substation. In those areas, spanning the floodplain may be infeasible. As such, rebuilding the 69-kV line may result in the introduction of construction activities is proximity to suitable LBV habitat.

LBV breeding can be affected by excessive construction noise, considered to be 60 dB(A) Leq at the edge of occupied habitat by the USFWS (USFWS, 2007c; American Institute of Physics, 2005). In accordance with Significance Criteria 1.a (Substantial adverse effect through any impact to one or more individuals of a federal or State-listed species), Significance Criteria 1.g (Substantial adverse effect through activities that result in the killing of migratory birds or destruction or abandonment of migratory bird nests and/or eggs), and/or Significance Criteria 4.d (Adversely affect wildlife through an increase in noise), direct or indirect impacts to the LBV could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-7a and BR-12.

Impact BR-7-SWF: Direct or indirect loss of southwestern willow flycatcher or direct loss of habitat. Designated critical habitat for the southwestern willow flycatcher occurs from MPs 24 to 24.5 and MPs 34.5 to 35. Based on the listed assumptions, the Talega-Escondido upgrades, including other improvements to the SDG&E and SCE systems, would not directly impact the SWF or SWF habitat or designated critical habitat (wetland/riparian habitats). Impacts to riparian/wetland habitats would generally be avoided by spanning drainages and through the sensate siting of access roads to avoid or minimize impacts upon those resources.

The 69-kV line upgrade crosses a 100-year and 500-year floodplain directly south of the Pala Substation and a few minor flooding areas exist to the north of the Lilac Substation. In those areas, spanning the floodplain may be infeasible. As such, rebuilding the 69-kV line may result in the introduction of construction activities is proximity to suitable SWF habitat.

SWF breeding can be affected by excessive construction noise, considered to be 60 dB(A) Leq at the edge of occupied habitat by the USFWS (USFWS, 2007c; American Institute of Physics, 2005). In accordance with Significance Criteria 1.a (Substantial adverse effect through any impact to one or more individuals of a federal or State-listed species), Significance Criteria 1.g (Substantial adverse effect through activities that result in the killing of migratory birds or destruction or abandonment of migratory bird nests and/or eggs), and/or Significance Criteria 4.d (Adversely affect wildlife through an increase in noise), direct or indirect impact to the SWF breeding activities could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-7a and BR-12.

Impact BR-7-GE: Direct or indirect loss of golden eagle or direct loss of habitat.

The golden eagle is very sensitive to human activity, especially in the vicinity of its nesting areas. Even distant construction activity or maintenance activity could cause abandonment of a nest, subsequent reproductive failure, and continuing decline of the species.

Human activity within 4,000 feet of a nest site is significant and not likely mitigable to a less-than-significant level, except when the activity occurring within 4,000 feet of the nest site (without direct line-of-sight and activity is below the nest site) and occurs where there is already an existing disturbance, such as a highly traveled road or a utility corridor that already contains large structures or if the activity is occurring underground (Bittner, 2007). There is one golden eagle nest area that occurs less than 4,000 feet from the existing Talega-Escondido corridor and there is direct line-of-sight between the nest area and the primary transmission line. The specific location of this nest area is not disclosed herein in order to protect the golden eagle.

In accordance with Significance Criteria 1.e (Substantial adverse effect on the breeding success of the golden eagle), Significance Criteria1.f (Directly or indirectly cause the mortality of a special status species), Significance Criteria1.g (Result in the abandonment of migratory bird nests and/or eggs), and/or Significance Criteria 1.h (Take golden eagles, eagle eggs, or any part of an eagle), direct or indirect impacts to the golden eagle would likely be significant and not mitigable to a less-than-significant level because of the distance to the nest area (less than 4,000 feet) and the direct line-of-sight that would occur. If off-setting compensatory resources could be identified and if that compensation were accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

PMEs BR-7b, BR-10, and BR-12 are recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to the golden eagle.

Impact BR-7-QCB: Direct or indirect loss of Quino checkerspot butterfly or direct loss of habitat. Parts of the northern portion of the Talega-Escondido upgrades occur in USFWS protocol survey areas (areas in which protocol surveys are required in suitable QCB habitat) for the QCB. While it is unlikely that the upgrades would impact much, if any, QCB-occupied habitat, the upgrades must be assumed to have a significant impact on this species. In accordance with Significance Criteria 1.a (Impact one or more individuals of a species that is federal or State listed as endangered or threatened), since adequate suitable lands required by PME BR-7c may not be available, direct or indirect impact to the QCB could be significant and would not likely mitigable to a less-than-significant level. If off-setting compensatory resources could be identified and if accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

PME BR-7 is recommended to, in whole or in part, minimize, mitigate, and/or compensate for impacts to the QCB.

Impact BR-7-AT: Direct or indirect loss of arroyo toad or direct loss of habitat. Although not confirmed during multi-year surveys conducted by MBA, the arroyo toad was purportedly observed in the vicinity of MPs 1 and 7 and at MPs 17 and 35 (Dudek, 2002). Based on the listed assumptions, the Talega-Escondido upgrades, including other related improvements to the SDG&E and SCE systems, would not directly impact arroyo toad riparian breeding habitat (wetland/riparian habitats). Impacts to riparian/wetland habitats would generally be avoided by spanning drainages and the sensitive siting of access roads to avoid or minimize impacts upon those resources.

The 69-kV line upgrade crosses a 100-year and 500-year floodplain directly south of the Pala Substation and a few minor flooding areas exist to the north of the Lilac Substation. In those areas, spanning the floodplain may be infeasible. As such, rebuilding the 69-kV line may result in the introduction of construction activities is proximity to suitable arroyo toad habitat.

Upland burrowing habitat for the toad could also be impacted by any new access road construction that occurs within suitable upland burrowing habitat (upland vegetation communities such as coastal sage scrub or oak woodland that contain sandy soil; can have gravel or cobbles) within one kilometer of arroyo toad occupied breeding habitat. Rebuilding the 69-kV line may also result in the introduction of construction activities is proximity to suitable arroyo toad upland burrowing habitat.

Potential indirect impacts to the arroyo toad from erosion, sedimentation, or decrease in water quality could occur if impacts were to affect arroyo toad breeding habitat. In accordance with Significance Criteria 1.a (Substantial adverse effect, either directly or indirectly, on one or more individuals of a federal or State-listed species), direct and indirect impact to the arroyo toad could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PME BR-7d, in combination with PMEs BR-1f, BR-1g, BR-1h, BR-2a, BR-2c, BR-4, and BR-5b.

Impact BR-7-SKR: Direct or indirect loss of Stephens' kangaroo rat or direct loss of habitat. A portion of the Talega-Escondido upgrades would occur in grassland habitat on Camp Pendleton that has the potential to support SKR. Although pull sites for installing the new 230-kV line on the existing 230-kV transmission towers are assumed to occur in developed and disturbed areas, disturbed habitat, or along existing access roads, there is the potential for SKR to be directly affected by construction should vehicles crush any occupied burrows that occur in these areas. Direct and indirect impacts to the SKR and its occupied habitat from habitat removal or disturbance from construction would be potentially significant according to Significance Criteria 1.a (Substantial adverse effect, either directly or indirectly, on one or more individuals of a federal or State-listed species).

The pre-construction surveys or the assumption of presence outlined in PME BR-7e would determine the presence/absence of SKR and, if presence is determined, compensatory mitigation would be formulated. With the small number of acres likely required for mitigation, it is expected that appropriate mitigation lands would be available to satisfy species-specific mitigation requirement. Direct or indirect impacts to the SKR could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-7e and BR-7b.

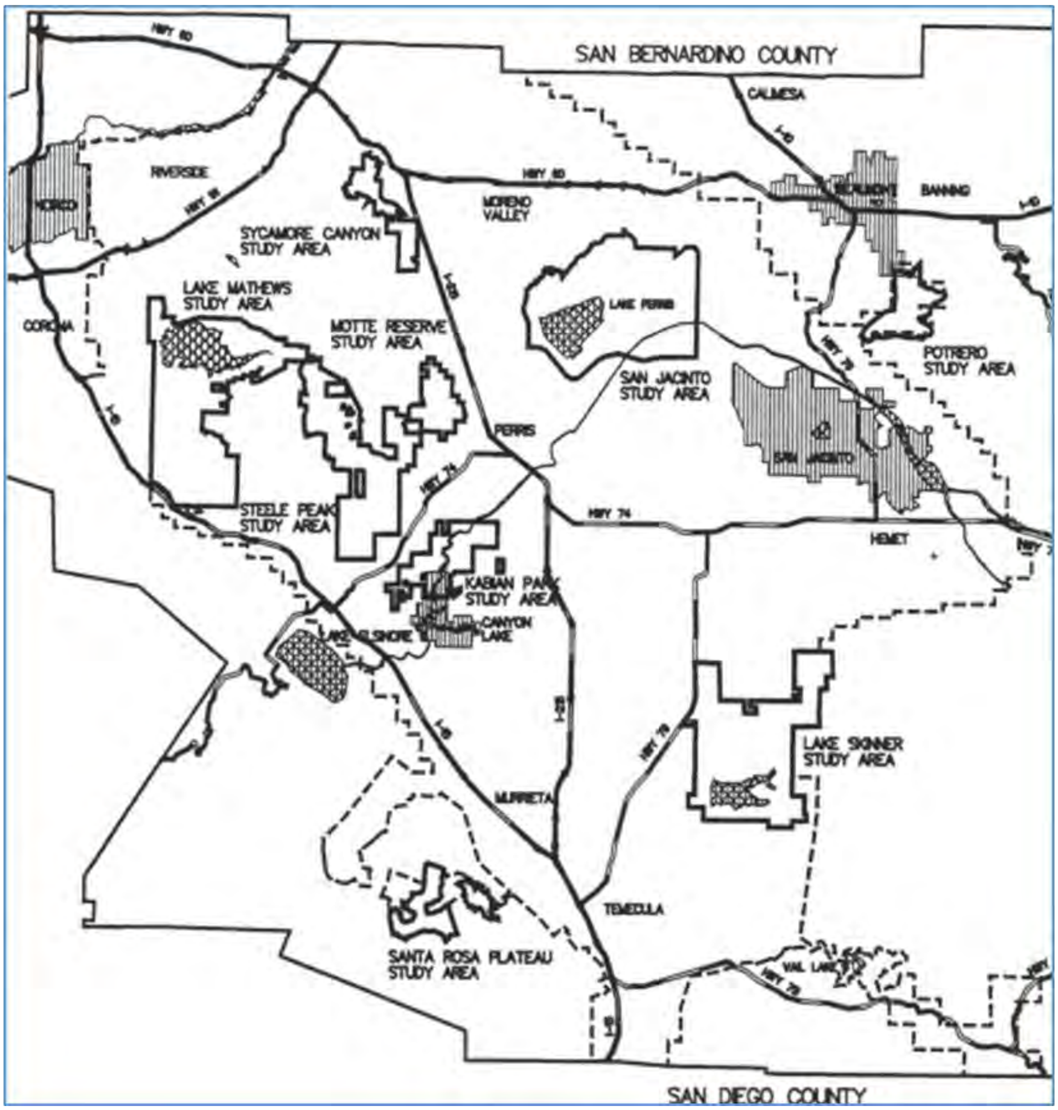

Figure E.3-11:Riverside County Stephens' Kangaroo Rat Habitat Conservation Plan
Source: County of Riverside

Impact BR-7-CGN: Direct or indirect loss of coastal California gnatcatcher or direct loss of habitat. Although not confirmed by multi-year surveys conducted by MBA, the CGN was purportedly observed in the vicinity of MPs 0.2 and 4.5 (Dudek, 2002). Designated critical habitat for the CGN occurs between MPs 0-3.5, MPs 21.8-27.8, and MPs 33-36.8.

Approximately two acres of CGN habitat (approximately 1.8 acres of Diegan coastal sage scrub and about 0.19 acres of Diegan coastal sage scrub-disturbed, some of which is critical habitat) would be directly impacted by construction of the Talega-Escondido upgrades between the Pala and Lilac Substations. With the small number of acres required for mitigation, it is expected that appropriate mitigation lands would be available to satisfy the mitigation requirement because this type of mitigation for the CGN is typically available and regularly provided in San Diego County.

CGN breeding can be affected by excessive construction noise, considered to be 60 dB(A) Leq at the edge of occupied habitat by the USFWS (USFWS, 2007c; American Institute of Physics, 2005). A noise impact affecting CGN-occupied or critical habitat or breeding activities could be potentially significant according to Significance Criteria 1.a (Substantial adverse effect through any impact to one or more individuals of a federal or State-listed species), Significance Criteria 1.d (Disturbance to critical habitat), Significance Criteria 1.g (Substantial adverse effect through activities that result in the killing of migratory birds or destruction or abandonment of migratory bird nests and/or eggs), and/or Significance Criteria 4.d (Adversely affect wildlife through an increase in noise).

Any direct or indirect impact to the CGN or its occupied or critical habitat or its breeding could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-7g.

3.4.6.2 Project Operation Impacts to RTE or Sensitive Species

Impacts to SKR from maintenance could occur from brush clearing if clearance activities were to damage burrows or if vehicles were to crush burrows along access roads. This impact could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-7e and BR-1g.

QCB has the potential to occur in specified USFWS protocol survey areas. Maintenance activities associated with the upgrades would not remove additional vegetation from the area but could adversely affect the QCB where access roads are maintained. This impact could be potentially significant but would be mitigable to a less-than-significant level with the implementation of PMEs BR-7c and BR-1g.

Impact BR-10: Presence of transmission lines would result in electrocution of, and/or collisions by, listed or sensitive bird species. The primary consideration with respect to bird collisions with transmission towers/lines and subtransmission poles/lines is during migration, especially in spring migration when strong winds and storms are more likely to force the birds to fly at relatively low altitudes. Most of this migration takes place at night. Mortality as a result of collision with these features would be greatest where the movements of migrating birds are the most concentrated.

The Talega-Escondido transmission line crosses numerous creeks and rivers, including Cristianitos Creek, San Mateo Creek, and Roblar Creek on Camp Pendleton, the Santa Margarita River along the northeastern portion, and Gomez Creek, San Luis Rey River, and Keys Creek on the Rainbow to Escondido portion (TNHC, 2007). These creeks and rivers may provide migration corridors for waterfowl or wading birds that are often victims of collisions with transmission lines, towers, poles, or static wires. However, other types of birds can also be collision victims. Since migration corridors have not been studied systematically, there is no supporting documentation available to quantify how many and what species of birds could actually be impacted by collision with the proposed Talega-Escondido upgrades and other related improvements to the SDG&E and SCE systems.

Because avian migration corridors have never been studied systematically, there is no way to know how many birds and what species of birds could actually be impacted by collision with transmission and subtransmission lines, towers, poles, or static wires. Therefore, it is assumed that some species could be federal or State-listed or of other special status.

According to Significance Criteria 1.a (Impact one or more individuals of a species that is federal or State-listed), Significance Criteria 1.f (Directly or indirectly cause the mortality of candidate, sensitive, or special status wildlife), and/or Significance Criteria 1.g (Killing of migratory birds or destruction or abandonment of migratory bird nests and/or eggs), any mortality of those species would be a significant impact that is not likely mitigable to a less-than-significant level. If off-setting compensatory resources could be identified and if that compensation were accepted by applicable resource agencies, this impact could be reduced to a less-than-significant level.

For non-sensitive species or species that migrate during the day, collision could be potentially significant according to Significance Criterion 1.f and 1.g but would be mitigable to a less-than-significant level with the implementation of PME BR-10.

According to a local eagle expert (Bittner, 2007), eagles do not tend to be collision victims, except on the smaller distribution lines (i.e., less than 69 kV), because their eyesight is so acute. Included as part of the Talega-Escondido upgrade is the rebuilding of a 69-kV subtransmission line on new poles along an approximately 7.8-mile stretch between the Pala and Lilac Substations. Because the 69-kV subtransmission line is already in place (positioned on the spare arm of the exiting Talega-Escondido 230-kV transmission towers), the relocation of that subtransmission line to new 69-kV poles would not significantly increase the existing hazards posed by the current 69-kV line configuration.

Impact BR-11: Presence of transmission lines would result in increased predation of listed and sensitive wildlife species by ravens that nest on transmission towers. Although predation may occur, the common raven has not been documented to prey on any listed or sensitive wildlife present along the Talega-Escondido corridor (Liebezeit et al., 2002). The 230-kV transmission alignment already contains towers that could be used by ravens for nesting. The 69-kV subtransmission upgrades include the installation of new steel poles (PME F-2b) between the Pala and Lilac Substations that are unlikely to support a raven nest. If ravens did nest along the alignment, the potential increase in raven predation would occur only on a limited basis and would be adverse but less than significant and no mitigation is required.

Impact BR-7-AC: Direct or indirect loss of arroyo chub or direct loss of habitat. The arroyo chub is considered highly sensitive because it is threatened in its native range, which includes San Juan Creek. Lake Elsinore water and any fish that may be transported from the existing lower reservoir (Lake Elsinore) to the proposed upper reservoir (Decker Canyon Reservoir) and subsequently introduced to the San Juan Creek drainage in the event of reservoir leakage, wall failure, or other planned or unplanned release, could increase predation or compete with native fish for aquatic resources, thus adversely affect the native fish population.

In order to introduce new fish populations into San Juan Creek, any such leakage would have to be extensive enough to carry enough water to support fish survival as the water flows down the canyon. No planned discharges to San Juan Creek are planned or proposed. Additionally, the upper reservoir will include both a double-liner system (low-permeability liner material and a geomembrane) and a collection system designed to minimize any potential for Lake Elsinore waters to comingle with waters in San Juan Creek. The only circumstances where sufficient waters may be transported from the upper reservoir into San Juan Creek would be the result of an operational failure. Since numerous fail-safe systems will be incorporated into the facility's design, any substantial release of waters to San Juan Creek would be both speculative and highly unlikely. As a result, it is anticipated that there would be no impact on the arroyo chub from the non-native fish from Lake Elsinore.

3.4.6.3 Proposed PME Measures

Nevada Hydro proposes to consult with agencies and stakeholders with the objective of reaching agreement on new field surveys. These are anticipated to include updated habitat assessments using qualified biologists to conduct reconnaissance-level windshield and/or pedestrian surveys of the proposed project area. The surveys would focus on locations that could provide suitable habitat for sensitive species. They would search for wildlife and sign, and identify areas impacted by wildfire and drought since 2006. Data collected would include detailed mapping and potential habitat for sensitive species. All information would be recorded on standardized datasheets, and Global Positioning Satellite (GPS) data would be collected for vegetation communities and sensitive species. This information would be recorded in a format that can easily be incorporated into environmental documents.

Protocol-Level Surveys

If protocol-level surveys are required to determine the presence or absence of sensitive species, Nevada Hydro proposes to consult with agencies and stakeholders with the objective of reaching agreement on study protocols to perform surveys using qualified biologists deployed in locations that could provide suitable habitat for sensitive species. Data collected would include detailed mapping and potential habitat for sensitive species. All information will be recorded on standardized datasheets as well as GPS locations and boundaries. This information will be presented in a format that can easily incorporated into environmental documents.

Based on the results of the literature review and input provided by the USFWS (USFWS 2014), protocol level surveys may be required for a number of species. The list below may expand or be reduced in size based on the results of the habitat assessment and/or future input from state and federal resource agencies.

- Arroyo toad (B*ufo californicus*)
- California gnatcatcher (*Polioptila californicus*)
- Least Bell's vireo (*Vireo bellii pusillus*)
- Southwestern willow flycatcher (*Empidonax traillii extimus*)
- Quino checkerspot butterfly (*Euphydryas editha quino*)
- California spotted owl (*Strix occidentalis occidentalis*)

3.5 Compliance with Local Management Plans

3.5.1 Regional Habitat Conservation Plans

Within NFS lands, the Project will be required to conform to and comply with the policies and procedures developed in the Forest Plan. Within BLM-administered lands, the Project will be required to conform to and comply with the "South Coast Resources Management Plan and Record of Decision."

The Riverside County's Western Riverside County MSHCP, SDG&E's "San Diego Gas & Electric Company Subregional Plan," and San Diego County's "San Diego Northern Multi-Species Conservation Plan Subarea" are separately discussed below.

Western Riverside County Multi-Species Habitat Conservation Plan. As illustrated in Figure E.3-12, the Western Riverside County MSHCP, as approved by the County of Riverside, participating cities, and State and Federal regulatory agencies in August 2004, is a comprehensive, multi-jurisdictional habitat conservation plan focusing on conservation of species and their associated habitats in western Riverside County. The goal of the Western Riverside County MSHCP is to maintain biological and ecological diversity within a rapidly urbanizing region. The Western Riverside County MSHCP establishes a multi-species conservation program that minimized and mitigates the expected loss of habitat values and the incidental take of “covered species” within the plan area and provides avoidance, minimization, and mitigation measures for impacts of proposed activities on those species and their habitats.

Under the Western Riverside County MSHCP, a single permit is issued to 22 Permittees for a period of 75 years. The approval of the Western Riverside County MSHCP and execution of the “Implementing Agreement” (IA) by the wildlife agencies allows signatories of the IA to issue “take” authorizations for all species covered by the plan, including federally-listed and State-listed species as well as other identified sensitive species and/or their habitats. Regional utility projects will contribute to the implementation of the Western Riverside County MSHCP and provide an additional contingency should other revenue sources not generate the projected levels of funding or should implementation costs be higher than projected. The Western Riverside County MSHCP is divided into multiple planning areas that contain regionally specific management issues. A portion of the Project is generally located within the Elsinore and Temescal Canyon Area Plans. To comply with the Western Riverside County MSHCP, the Applicant may be required to complete the Habitat Evaluation Acquisition and Negotiation System (HANS) process. In addition, the County also requires habitat assessments and focused surveys were appropriate for burrowing owl and narrow endemic plants, as well as riparian/riverine and vernal pool assessments and urban/wildlands interface analyses.

The Western Riverside County MSHCP protects sensitive biological resources while affording cities and other municipal agencies within its boundaries the ability to develop their lands within an expeditious and controlled manner. As part of establishing core conservation areas for the plan’s system of habitat preserves, focus is being given to acquiring private lands. Public lands, such as those managed in the CNF, are recognized for contributing to core preserve designs and habitat linkages; however, management of these public lands is left to the requirements and policies of the respective public agency. Most of the Project area, outside of those elements located in the Lake Elsinore area, are located either within the CNF or in San Diego County and are, therefore, not regulated by the Western Riverside County MSHCP.

In respond to that correspondence, as contained in the final EIR/EIS, the County of Riverside noted: “The Draft MSHCP and the accompanying IA contemplate the need for future facilities that are proposed by non-Permittees, such as the projects proposed by EVMWD, and provide a mechanism for such future facilities to receive take authorization pursuant to Section 11.8 of the IA. The MSHCP supports a Permit that would be issued under Section 10(a)(1)(B) of the Federal Endangered Species Act (FESA). Section 10(a)(1)(B) of FESA provides for take of federally-listed species related to non-Federal actions. Projects that involve Federal actions that may have an effect on federally-listed species are not permitted take authorization through Section 10(a)(1)(B), and must pursue take under Section 7 of FESA. Therefore, a project that involves a Federal action that may affect federally-listed species would be subject to the Federal consultation process outlined in Section 7 of FESA. Under the current proposed structure of the Draft MSHCP and the Draft IA, assuming the [Elsinore Valley Municipal Water] District requires take authorization for listed species under FESA, it may elect to either obtain such take authorization through the MSHCP or through independent FESA Section 10 (a) or 7 processes. If the [Elsinore Valley Municipal Water] District elects not to pursue take authorization through the MSHCP, it would not be subject to the requirements of the MSHCP. If EVMWD seeks to become a Participating Special Entity, a mutually agreeable mitigation program would need to be negotiated. If EVMWD did not agree that the mitigation was reasonable, they could choose not to utilize the MSHCP, and could seek take authorization independently from the appropriate agencies.”

On March 19, 2008, the USFWS issued a draft biological opinion (BO) that, among other issues, addressed the MSHCP. The BO contains a detailed “species by species evaluation” of each of the 146 “covered species" (including 14 federally-listed animals, 11 federally-listed plants, and 121 unlisted plants and animals).

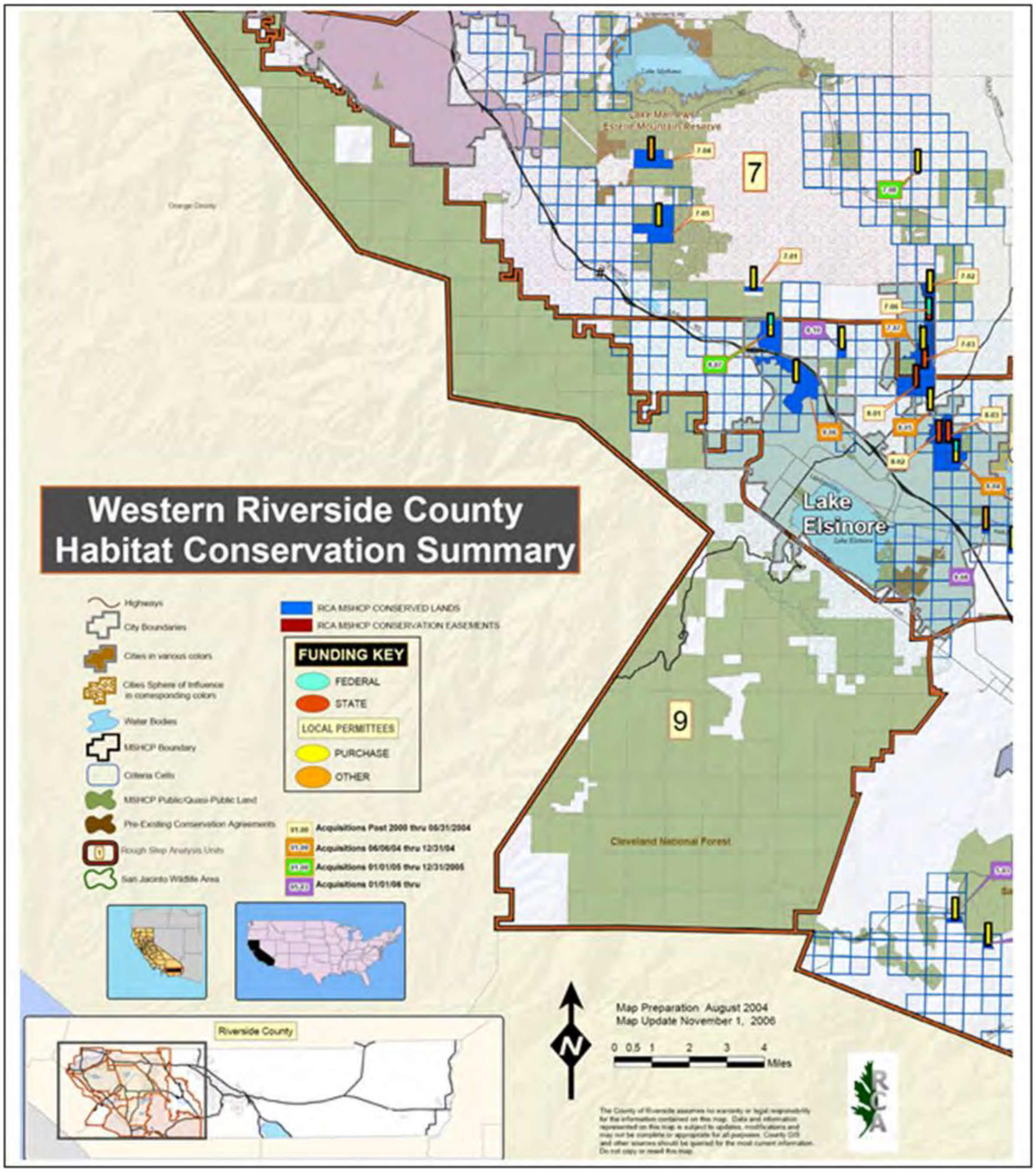

Figure E.3-12:Western Riverside County Multi-Species Habitat Conservation Plan
Source: County of Riverside

San Diego Gas & Electric Company Subregional Plan. The proposed Talega-Escondido 69/230 kV transmission line upgrade may benefit from the ground disturbance and take authorizations of the existing "San Diego Gas & Electric Company Subregional Plan" (USFWS Permit No. 809637), as issued on December 12, 1995.

San Diego Northern Multi-Species Conservation Plan Subarea. The "San Diego Northern Multi-Species Conservation Plan Subarea" study area encompasses about 313,777 acres roughly encompassing the areas north of the San Dieguito River, Elfin Forest and Harmony Grove, north of Camp Pendleton, DeLuz, Fallbrook, Rainbow, Pauma Valley, Lilac, Valley Center, Rancho Guejito and the majority of Ramona. Since the Northern San Diego County subarea has not yet been adopted, no current compliance obligations exist with regards thereto.

In San Diego County, with the exception of the proposed Talega-Escondido 69/230-kV transmission upgrades and existing SDG&E substation sites, all portions of the Project are located on Federal CNF lands and are subject to the resource conservations plans of those administrating Federal agencies.

Lake Mathews Multi-Species Habitat Conservation Plan. The 13,000-acre Lake Mathews Multi-Species Habitat Conservation Plan was approved by the USFWS and CDFG in December 1995.

City of Lake Elsinore 2005 Fisheries Management Plan for Lake Elsinore. The Fisheries Management Plan for Lake Elsinore is referenced and incorporated by reference herein is the "Fisheries Management Plan for Lake Elsinore."[19] The fisheries management plan provides detailed information concerning the aquatic environment and resources in Lake Elsinore and presents strategies for improving and enhancing sport fishing and nutrient reduction, including carp removal and control, fish stocking, enhancing lake spawning and rearing habitats, and monitoring.

County of Riverside. The Western Riverside MSHCP was approved by the County Board of Supervisors on June 17, 2003 and by the USFWS and CDFG on June 22, 2004. The Western Riverside County MSHCP area is 1.2 million acres and the proposed conservation area, including public lands, is approximately 500,000 acres.

As determined by the Riverside County Board of Supervisors, based on an assessment of the Riverside County General Plan's program EIR, with regard to biological resources, the following unmitigatable adverse impacts were identified: (1) Implementation would result in the direct mortality of individuals of listed, proposed, or candidate species or loss of habitat occupied by such species; (2) Alteration or loss of habitat of listed proposed, or candidate species that inhibits or compromises recovery efforts that could otherwise lead or contribute to the delisting of the species; (3) Implementation would cause direct loss of sensitive habitat; (4) Implementation would cause habitat fragmentation resulting in isolation of sensitive habitat patches, creating a "checkerboard" pattern of small habitat patches of limited biological value; (5) The Riverside County General Plan would cause fragmentation of habitat that constricts, inhibits, or eliminates wildlife movement; and (6) Implementation would result in alteration of habitat or natural processes that would result in the direct or indirect mortality of listed, proposed, or candidate species or that would result in loss, fragmentation, or isolation of sensitive habitat(s).[20]

County of San Diego. San Diego County's "San Diego North County Multi-Species Conservation Plan Subarea Plan" (San Diego North County MSCP) encompasses about 313,777 acres roughly encompassing the areas north of the San Dieguito River, Elfin Forest and Harmony Grove, north of Camp Pendleton, DeLuz, Fallbrook, Rainbow, Pauma Valley, Lilac, Valley Center, Rancho Guejito, and the majority of Ramona. That plan has not yet been adopted and does not currently pose additional regulatory policies or procedures with regard to the Project.

South Coast Wildlands Project. In November 2000, a San Diego wildlife conference involving, among other parties, the California Department of Parks and Recreation, the USGS, The Nature Conservancy, and the California Wilderness Coalition, resulted in the publication of "Missing Linkages: Restoring Connectivity to

[19]/ Op. Cit., Final Fisheries Management Plan for Lake Elsinore, Riverside County, California, 2005.

[20]/ Op. Cit, CEQA Findings of Fact and Statement of Overriding Considerations of the Board of Supervisors of Riverside County for the 2003 Riverside County General Plan, October 7, 2003, Findings of Fact for Riverside General Plan Impacts and Mitigation Measures, Environmental Impacts 4.6.1, 4.6.2, 4.6.3, 4.6.4, 4.6.5, and 4.6.7.

the California Landscape," which identified 232 "critical habitat linkages" throughout California, and spurred the subsequent establishment of the South Coast Wildlands Project (SCWP). As illustrated in Figure E.3-13, the existence of a number of "missing linkages" to wildlife connectivity have been suggested. The following linkages were identified in the general Project area: (1) "Linkage No. 12 (Santa Margarita - Pechanga)," identified as a "landscape linkage/choke point" linkage; (2) "Linkage No. 54 (De Luz – Sandia Creek)," identified as a "riparian with agriculture" linkage; (3) "Linkage No. 55 (Tenaja)," identified as a "landscape linkage"; and (4) "Linkage No. 56 (Pechanga Corridor," identified as a "landscape linkage."

The SCWP launched the collaborative "South Coast Missing Linkage Project," described by its participants as an ecoregional planning effort undertaken in support of the Statewide vision of the Missing Linkages conference. As indicated in the 2004 "A Linkage Design for the Santa Ana – Palomar Mountains Connection," the SCWP indicates that the "Santa Ana – Palomar Mountains Linkage is a landscape-level linkage needed to sustain a network of interconnected wildlands in the South Coast Ecoregion. The linkage joins the Santa Ana Mountains and its coastal lowlands to the Palomar Mountains and inland ranges of San Diego County. . .Santa Ana – Palomar Mountain Linkage was one of the 15 linkages whose protection is crucial to maintaining ecological and evolutionary processes among large blocks of protected habitat within the South Coast Ecoregion as well as adjoining ecoregions. Identification of these 15 priority linkages launched the South Coast Missing Linkages Project."

Based on an analysis of 21 focal species deemed sensitive to habitat loss and fragmentation and considered representative of a broad range of habitat and movement requirements, the SCWP identified potential routes between existing protected areas and formulated a "least-cost corridor" (described as the lowest relative cost for a species to move between protected core habitat or population areas) for eight selected species. The species-specific corridors identified for the target species were combined to create a "least cost union" (described as the best zone available for focal species movement). The size and configuration of that union was then analyzed relative to the habitat needs of the 21 focal species in order to establish a "linkage design" (described as the target area for linkage conservation efforts). The 398 square kilometer (98,298 acre) "least cost unit," as identified in Figure E.3-14, represent SCWP's assessment of the "best movement habitat through the linkage and encompasses both upland and riparian habitat connections." The recommended "linkage design" would provide live-in and move-through habitat for all 21 focal species.

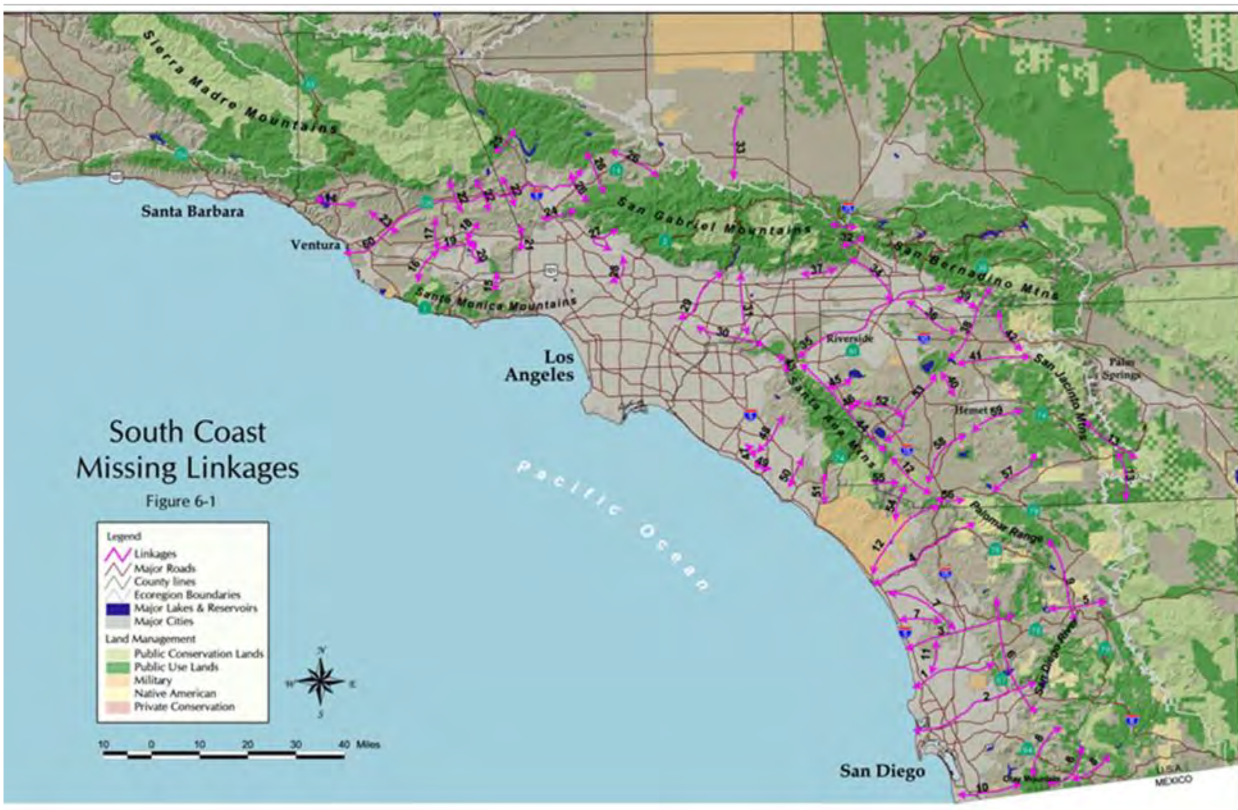

Figure E.3-13:South Coast Ecoregion South Coast Missing Linkages
Source: San Diego State University

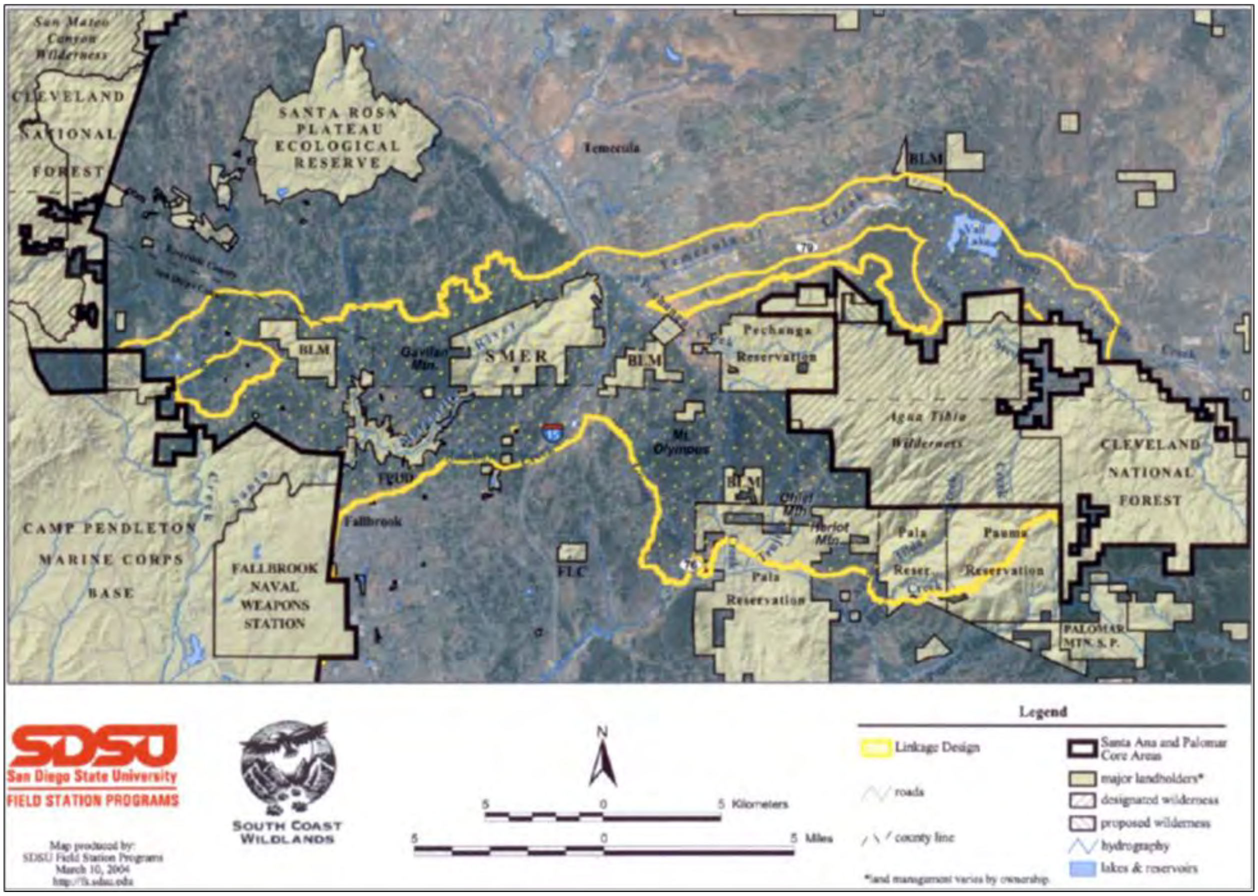

Figure E.3-14:Santa Ana – Palomar Mountains Linkage
Source: South coast Wildlands Project

3.6 Cumulative impacts

The Applicant proposes to complete the cumulative impacts analysis once the new field studies are done. The baseline impacts need to be updated (based on the new field studies proposed as PMEs above) before the cumulative impacts analysis can be meaningfully updated.

BLUEWATER
RENEWABLE ENERGY STORAGE

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E ENVIRONMENTAL REPORT SECTION 4 – HISTORICAL AND ARCHAEOLOGICAL RESOURCES

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

The Nevada Hydro Company, Inc.

538 Monte Vista Ave
Glendale, California 91202
T: (951) 585 3277

Federal Energy Regulatory Commission
Project Number: P-14227
October 2022

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Exhibit E – Section 4

Section 4 – Historical and Archeological Resources

As required under 18 CFR 4.41(f)(4), the Applicant is to prepare a Report on historical and archaeological resources. The applicant must provide a report that discusses any historical and archaeological resources in the proposed project area, the impact of the proposed project on those resources and the avoidance, mitigation, and protection measures proposed by the applicant. The report must be prepared in consultation with the State Historic Preservation Officer (SHPO) and the National Park Service of the U.S. Department of Interior. The report must contain:

(i) A description of any discovery measures, such as surveys, inventories, and limited subsurface testing work, recommended by the specified state and Federal agencies for the purpose of locating, identifying, and assessing the significance of historic and archaeological resources that would be affected by construction and operation of the proposed project, together with a statement of the applicant's position regarding the acceptability of the recommendations;

(ii) The results of surveys, inventories, and subsurface testing work recommended by the state and Federal agencies listed above, together with an explanation by the applicant of any variations from the survey, inventory, or testing procedures recommended;

(iii) An identification (without providing specific site or property locations) of any historic or archaeological site in the proposed project area, with particular emphasis on sites or properties either listed in, or recommended by the SHPO for inclusion in, the National Register of Historic Places that would be affected by the construction of the proposed project;

(iv) A description of the likely direct and indirect impacts of proposed project construction or operation on sites or properties either listed in, or recommended as eligible for, the National Register of Historic Places;

(v) A management plan for the avoidance of, or mitigation of, impacts on historic or archaeological sites and resources based upon the recommendations of the state and Federal agencies listed above and containing the applicant's explanation of variations from those recommendations;

(vi) The following materials and information regarding the mitigation measures described under paragraph (f)(4)(v) of this section; and

(A) A schedule for implementing the mitigation proposals;

(B) An estimate of the cost of the measures; and

(C) A statement of the sources and extent of financing.

(vii) The applicant must provide five copies (rather than the eight copies required under §4.32(b)(1) of the Commission's regulations) of any survey, inventory, or subsurface testing reports containing specific site and property information, and including maps and photographs showing the location and any required alteration of historic and archaeological resources in relation to proposed project facilities.

4.0. HISTORICAL AND ARCHEOLOGICAL RESOURCES

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires FERC to evaluate potential effects of its undertakings on properties listed or eligible for listing in the National Register of Historic Places (NRHP).[1] Federal listing generally requires that a building or structure be at least fifty years of age and possess "the quality of significance in American history, architecture, archaeology, engineering and culture present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, material, workmanship, feeling and association."[2]

Section 106 of the NHPA requires FERC to take into account the effects of its undertakings on historic properties and to afford the Advisory Council on Historic Preservation (Council) a reasonable opportunity to comment. Section 106 is implemented through the Council's regulations, "Protection of Historic Properties" (36 CFR Part 800). For hydropower licensing actions, FERC typically completes Section 106 by entering into a programmatic agreement (PA) or memorandum of agreement (MOA) with the license applicant, the Council, and the State and/or tribal historic preservation officer (SHPO/THPO). This agreement is then incorporated by reference into the hydropower license when issued.

4.1. Historical and Archeological Resources Environmental Setting[3]

Archaeological evidence from continuous near-shore sediment deposits indicate that Lake Elsinore contained water nearly continuously over the past 8,400 years, permitting humans to thrive permanently within the area since at least the mid-Holocene.[4] Much of the following

[1]/ The federal criteria includes buildings and structures that: (1) are associated with events that have made a significant contribution to the broad patterns of our history; (2) are associated with the lives of persons significant in our past; (3) that embody the distinctive characteristics of a type, period, or method of construction that represents the work of a master or that possesses high artistic values or that represents a significant and distinguishable entity whose components may lack individual distinction; or (4) that have or are likely to yield information important in prehistory or history.

[2]/ 36 CFR Part 800.

[3]/ Information presented herein is derived, in part, from the: (1) "Lake Elsinore Advanced Pumped Storage Project (LEAPS) & Talega-Escondido/Valley-Serrano 500kV Interconnect Project – Historic Properties Management Plan, FERC No. 11858-002-California" (Chambers Group, Inc. February 2005); (2) "Cultural Resources Investigation for the Elsinore Advanced Pumped Storage Project, Lake Elsinore, Riverside County" (Archaeological Associates, 2003); and (3) Phase I Cultural Resource Study – Elsinore Valley Municipal Water District Pumped Storage Hydroelectric Project, Lake Elsinore, Riverside County" (Archaeological Associates, 1997). Since those documents contain sensitive cultural resource information, those studies are incorporated by reference herein but are subject to specific disclosure limitations designed to protect sensitive cultural resources.

[4]/ Kirby, Matthew, E., et al., Late Holocene Lake Level Dynamics Inferred from Magnetic Susceptibility and Stable Oxygen Isotope Data: Lake Elsinore, Southern California, Journal of Palocliminology, Vol. 31, 2004, p. 278.

discussion has been taken from the Draft Historic Resource Management Plan (HRMP), which was prepared during the Project No. 11858 proceeding. The Prehistoric Section directly below has been culled from various reports. In consultation with the State Historic Preservation Office (SHPO), an "area of potential effect" (APE) has been used, in part, to define the Project's APE.

4.1.1. Prehistoric Setting

This section provides a brief overview of the prehistory and history of the Project area. A more detailed description can be found in ethnographic studies, mission records, and major published sources including Kroeber (1925), Wallace (1955), Warren (1968), Heizer (1978), Moratto (1984), and Chartkoff and Chartkoff (1984). Fagan (2003), Moratto and Chartkoff and Chartkoff provide recent overviews of California archaeology in general and review the history of the desert regions in southern California. The most accepted regional chronology for the coastal and central interior southern California is derived from Wallace's four-part Horizon format, which was later updated and revised by Warren.

Presently, regional archaeologists generally follow Wallace's southern California format but the loosely established times for each period subunit are often challenged. The documented stages are as follows: Desert Culture (12000 to 10000 B.C.), Western Hunting Culture or Lake Mohave Period (~9000 to 5000 B.C.), Pinto Period (5000 to 2,500 B.C.), and Protohistoric (2500 B.C. to 1769 A.D.).

Desert Culture Period. Comparatively, little is known of Paleo-Indian peoples in the California archaeological record, although highly documented archaeological village sites in the Southwest have revealed associated bones of now extinct large mammals, as well as Clovis and Folsom tool traditions. This period is noted for an increase in drier weather, consequently most of the known California Late Paleo-Indian/Early Archaic sites are located near extinct desert valley lakes, rock shelters and on the Channel Islands off the coast. These consist of occupation sites, butchering stations, and burials. This period ends with a marked extinction of large game native to North America and a distinct change in prehistoric tool kits used to prepare plant foods. Small projectile points, choppers, flat scrapers, drills, and digging sticks are also common.

Western Hunting Culture or Lake Mohave Period. It is thought that as the hunting of large mammals became less available as a food resource due to drier weather conditions, the West and Southwest showed an increased reliance in using small game, such as squirrels and rabbits, and wild plants to sustain the small tribal bands. This period is also marked by the absence of food grinding stone implements. However, the period ends when stone grinding implements become increasingly more prevalent in the archaeological record.

Pinto Period. The Pinto Period highlights a combination of both Desert Culture and Western Hunting Cultures, where an increase in grinding tools appears in the archaeological record. Such tools suggest an increased level of reliance on wild plants and small animals. The Pinto spear-point tool tradition is the hallmark of this period. This tradition is characterized by small coarsely chipped points, which tend to be triangular and sometimes are found with parallel sides. A slight variation in tool type appears towards the end of this period, which is represented by Gypsum points and Elko points. The Gypsum point is typified by its contracting stem, whereas Elko points are corner notched.

Protohistoric. In the southwestern Great Basin, this period is characterized as having cooler and wetter conditions than that previously experienced, an environment similar to that of today. Sites appear in previously unoccupied areas of California. The numbers of sites in some regions, especially near ephemeral lakes, seem to have risen dramatically. These changes reflect a phenomenon found throughout the western United States where an increase in population and changes in tool kits and living arrangements resulted in more specialized uses of materials and landscapes. Diagnostic artifacts associated with this period consist of Elko and Gypsum projectile points.

Saratoga Springs Period. The Saratoga Springs Period is environmentally similar to earlier periods. In the southwest Great Basin, this period is characterized by the introduction of the bow and arrow, exploitation of the pine nut and an increase in logistical complexity relative to landscape use. With these changes came a diversification of resource use and a more sedentary settlement pattern in the Owens Valley. The nature and number of sites attributed to this time period changed such that the “winter villages” became larger, numbers of such villages were reduced, and base camps in the upland areas became larger, more diversified and more numerous. The abandonment of village sites at the end of the Late Prehistoric Period is attributed to a change in climate and is an event mirrored in other parts of the American Southwest, California, and Mexico. Trade of Coso obsidian in southern California apparently ended during this period.

Ethnographic Setting. The Native American inhabitants occupying most of Los Angeles, Orange, and Riverside Counties at the time of the Spanish arrival had not always held these territories. Their earliest well-documented predecessors, who are known only archaeologically, are collectively referred to as the “Millingstone” peoples. Millingstone groups are thought to have been scattered over much of southern California from as early as 6000 B.C. The Millingstone people were principally seed and root gatherers who rarely seemed to have developed large settlements and who probably never occupied a single area on a year-round basis.

About 1500 B.C., stone mortars and pestles were utilized. This era has been called the “Intermediate” and is poorly understood. What appears certain is that the Intermediate peoples were replaced by Shoshoneans who moved in from the Great Basin. The exact time the Shoshonean “incursion” took place is uncertain but most authorities place it somewhere between 500 and 1000 A.D.. The indigenous Intermediate populations were either absorbed or decimated as the Shoshonean speakers settled the entire coast, from about the latitude of the southern edge of the Santa Monica Mountains south to the area of the San Luis Rey River. Their territory extended inland across Riverside County. By the time of the Spanish arrival, the Shoshoneans had become subdivided into three groups: (1) the Gabrielino who occupied Los Angeles and northern Orange Counties; (2) the Juaneňo who resided around what became San Juan Capistrano; and (3) Luiseňo who lived in western Riverside and northern San Diego Counties.

The Proposed Project area is located along the border of the territories known to have been occupied by the Juaneňo and Luiseňo Indians. It is likely that both groups passed through or exploited resources within the Proposed Project area at different times; therefore, both groups are discussed below. The northern and eastern portions of the Proposed Project's area were part of the territory occupied by the Juaneňo or Acjachemem. The western portions of the Proposed Project area are located in the territory, known ethnographically, to have been occupied by the Luiseňo.

Juaneňo. The northern and western portions of the Proposed Project area were part of the territory occupied by the Juaneňo or Acjachemem Native American group when the Spanish arrived in 1769 A.D. Ethnographic descriptions of the Juaneňo are often given in terms of their neighbors to the south (Luiseňo) but also point to a separate cultural identity. An important account of the Juaneňo culture was written by Geronimo Boscana, friar at Mission San Juan Capistrano from 1812 to 1826.

Juaneňo settlement and subsistence systems may extend back in time to the beginning of the Late Prehistoric Period, about A.D. 650. The Juaneňo were semi-sedentary hunters and gatherers. One of the most important food resources for inland groups was acorns gathered from oak groves in canyons, drainages, and foothills. Acorns were ground into flour using mortars and pestles. Seeds from sage and grasses, goosefoot, and California buckwheat were collected and ground into meal using manos (grinding stones) and metates (grinding bowls or slabs, made of stone). Protein was supplied through the meat of deer, rabbits, and other animals, hunted with bow and arrow or trapped using snares, nets, and deadfalls. Coastal dwellers collected shellfish and used carved shell hooks for fishing in bay/estuary, nearshore, and kelp bed zones. Dried fish and shellfish were probably traded for inland products, such as acorns and deer meat.

The Juaneňo lived in villages of up to 250 people located near permanent water and a variety of food sources. Each village was typically located at the center of an established territory from which resources for the group were gathered. Small groups left the village for short periods of time to hunt, fish, and gather plant foods. While away from the village, they established temporary camps and created locations where food and other materials were processed. Archaeologically, such locations are evidenced by manufacturing or maintenance of stone tools used in hunting or butchering. Overnight stays in field camps are evidenced by fire-affected rock used in hearths.

The San Juan basin was densely populated and villages were closely spaced because of the year-round availability of fresh water in San Juan Creek and its tributaries. The village of *Acjacheme* was located just east of the present location of Mission San Juan Capistrano. The village of *Putuidem* was located at the confluence of Oso and Trabuco Creeks. *Tobna* was located on the east bank of San Juan Creek, near its mouth. The village of *Sajavit* was located at the original mission site

Luiseňo. The western portion of the Proposed Project area is located in the territory known ethnographically to have been occupied by the Luiseňo, a Takic-speaking people. The term Luiseňo was given by the Spanish to the native group who were living in the area under influence of Mission San Luis Rey. The Luiseňo lived in sedentary and autonomous village groups, each with specific subsistence territories encompassing hunting, collecting, and fishing areas. Villages were typically located in valley bottoms, along streams, or along coastal strands near mountain ranges where water was available and village defense was possible. Inland populations had access to fishing and gathering sites on the coast, which they used during the winter months.

Luiseňo subsistence was centered around the gathering of acorns, seeds, greens, bulbs, roots, berries, and other vegetal foods. This was supplemented with hunting mammals, such as deer, antelope, rabbit, woodrat, ground squirrels, and mice, as well as quail, doves, ducks, and other birds. Bands along the coast also exploited marine resources, such as sea mammals, fish, crustaceans, and mollusks. Inland trout and other fish were taken from mountain streams.

Hunting was done both individually and by organized groups. Tool technology for food acquisition, storage, and preparation reflects the size and quantity of items procured. Small game was hunted with the use of curved throwing sticks, nets, slings, or traps. Bows and arrows were used for near-shore ocean fishing. Coiled and twined baskets were made for food gathering, preparation, storage, and serving. Other items used for food processing included large shallow trays for winnowing chaff from grain, ceramic and basketry storage containers, manos and metates for grinding seeds, and ceramic jars for cooking.

Villages had hereditary chiefs who controlled religious, economic, and territorial activities. An advisory council of ritual specialists and shamans was consulted for environmental and other knowledge. Large villages located along the coast or in inland valleys may have had more complex social and political structures than settlements controlling smaller territories. Most Luiseňo villages contained a ceremonial structure enclosed by circular fencing located near the center of the village. Houses were semi-subterranean and thatched with locally available brush, bark, or reeds. Earth-covered semi-subterranean sweathouses were also common and were used for purification and curing rituals.

The first Europeans to explore the west coast were with Francisco de Ulloa, who accompanied Hernan Cortés in his first expedition to California. The account of this voyage marks the first recorded application of the name "California." The Luiseňo first came into contact with Europeans in 1769, when the expedition led by Gaspar de Portolá arrived in their territory. That same year, the San Diego Mission was established just to the south, followed by the San Juan Capistrano Mission in 1776 and the San Luis Rey Mission in 1798. Poor living conditions at the missions and introduced European diseases led to a rapid decline of the Luiseňo population. Following the Mission Period (1769-1834), Luiseňo Indians scattered throughout southern California. Some became serfs on the Mexican ranchos, other moved to newly founded pueblos established for them, some sought refuge among inland groups, and a few managed to acquire land grants. Later, many moved to or were forced onto reservations. Although many of their cultural traditions have been suppressed during the Mission Period, the Luiseňo were successful at retaining their language and certain rituals and ceremonies. Starting in the 1970’s, there was a revival of interest in the Luiseňo language and classes were organized. Since then, traditional games, songs, and dances have been performed, traditional foods have been gathered and prepared, and traditional medicines and curing procedures have been practiced.

4.1.2. Creation Stories of Lake Elsinore and its Associated Hot Springs

Site CA-RIV-2798 is not only significant archaeologically, but ethnohistorically as well. The Lake Elsinore area has an extensive history of human habitation and the area has been described historically as follows:. "In addition to a stable water supply and a variety of terrestrial floral and faunal species, the local area contains abundant high-quality lithic resources; hot springs that were significant to the Late Prehistoric peoples and probably earlier groups; and fish, waterfowl, and other aquatic resources that became increasingly scarce with climatic warming during the Holocene. As a result of this unique setting, people have found the site attractive since their initial entry into the region nearly 10,000 years ago, presumably moving throughout the area as resources became available in the different environmental zones."[5]

Both Lake Elsinore and the hot springs to the north are ethnogeographically named in both the Juaneňo and Luiseňo languages. The Juaneňo referred to Lake Elsinore as *Paayaxtic* and the Luiseňo referred to it as *Paahashnan*. In Juaneňo tradition, man was created out of the mud of the lake. The area around the hot springs was known to the Luiseňo as *Atengvo*. "Luiseño territory extended from Agua Hediona Creek northwest to Aliso Creek along the coast, then east to Santiago Peak and south through the Lake Elsinore area to just south of Mount Palomar. Whereas other groups were familiar with Lake Elsinore, according to the relevant literature, the lake is clearly in Luiseño territory. . .Lake Elsinore itself plays a considerable role in the creation myth and religion of the Luiseño and Juaneño. In addition, the Elsinore Hot Springs near the outlet channel is significant to both the Luiseño and the Juaneño. It was at this location, known as *Itengvu Wumowmu*, that Wiyot, a religious leader who let the people out of the north died. When Wiyot grew ill and started to die, the people took him to a number of hot springs in the area in an effort to cure him. Elsinore was the last of these hot springs, and it was here that he died."[6]

The lake was recorded in 1982 as a "traditional cultural property" and identified as eligible for inclusion in the NRHP.[7]

Location of Ethnohistoric Villages. Kroeber's location of Paiahche near Lake Elsinore led one to believe that it corresponded to site CA-RIV-2798. Excavations at CA-RIV-2798, however, did not produce a major Late Prehistoric/Ethnohistoric component. It is not known whether this is because the village was in another location or whether settlement during this period consisted of small, seasonal, resource procurement camps, instead of a large habitation site.

Hall and Slater hypothesize that Tenaja Village (CA-RIV-217) may have been the ethnohistoric village of *Palasakeuana*, as referenced by Kroeber, and that the area (Tenaja Valley) may have been a refuge area for "neophytes" escaping from Spanish control at San Luis Rey Mission. Keller shows the location of Tenaja Valley on Kroeber's (1925) map of *Palasakeuna* and they are

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5/ Grenda, Donn R., Continuity and Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore, Statistical Research, Inc., Technical Series 59, January 1997, p. 3.

6/ Ibid., p. 22.

7/ Chambers Group, Inc., Lake Elsinore Advanced Pumped Storage Project (LEAPS) & Talega-Escondido/Valley-Serrano 500kV Interconnect Project – Historic Properties Management Plan, FERC No. 11858-002-California, February 2005, p. 2-11.

not in the same location. While no scale is provided on the Kroeber map, the two villages are separated by nearly an inch. Nonetheless, it is clear that CA-RIV-271 is a major village heavily occupied during the Late Prehistoric. Moreover, its relatively remote location would argue for relatively late occupation into the Historic Period. Obsidian Butte hydration readings as low as 1.1 microns from the site also suggest possible occupation into the ethnohistoric period. It is possible that Kroeber did not visit the remote Tenaja Valley or that the location of the village on Kroeber's map is inaccurate.

4.2. Historic Setting

The territory of the present State of California was "discovered" in 1542 by a Portuguese navigator in the Spanish service named J. R. Cabrillo. In 1578, Sir Francis Drake landed at Drake's Bay, opened communication with the natives, and took possession of the country in the name of England, calling it New Albion. It was explored by the Spaniard S. Viscayno in 1602 but no attempt was made at colonization until the Franciscan Fathers established a mission at San Diego in 1769. Within the next 50 years they founded 21 missions.[8]

In 1769, the Spanish mission expeditions led by Junipero Serra and Gaspar de Portolá established settlements from San Diego to Monterey. Portolá camped at an Indian village north of San Onofre on July 22, 1769, on his way north to Monterey Bay. That same year, the San Diego Mission was established just to the south, followed by the San Juan Capistrano Mission in 1776 and the San Luis Rey Mission in 1798. It was in 1797 that Fray Juan Santiago set out from the Mission San Juan Capistrano in search of a new mission site. He and his party were among the first groups of white men to travel over what was then regarded as the Sierra de Santiago and to descend into Lake Elsinore. Here, they likely camped along the shoreline before continuing their journey to Temecula. Ultimately, Fray Juan Santiago went on to identify the site of what was to become Mission San Luis Rey.

The town of Lake Elsinore first appears in the land records as part of the Rancho La Laguna, the original land grant of three square leagues, given to Julian Manriquez by the Mexican Governor of California in 1844. The grant was roughly oval in shape and included all of the lakebed and shoreline. In 1858, Abel Sterms sold the original La Laguna land grant to Augustine Machado. Augustin Machado and his wife (Ramona) and their twelve children lived on the land in an adobe located on the west and southwest side of the modern shoreline of Lake Elsinore. The Machado adobe was a regular stopping place for the Butterfield Overland Mail stage whose route ran from the Temecula Station up the valley, passing through Murrieta, Wildomar, along the westerly side of Lake Elsinore, and then toward Perris. Machado died in 1865 and, after receiving the patent for the land in 1872, his wife and children sold their shares to Charles Sumner in 1873. Sumner lost all the property in 1877 by defaulting on his mortgage loan and the land was purchased by a partnership of businessmen: Franklin Heald, Donald Graham, and William Collier. By 1885, the partnership had been able to pay off the mortgage with proceeds from the sale of plots of land.

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[8]/ Swanton, John R., The Indian Tribes of North America, Smithsonian Institution Bureau of American Ethnology Bulletin 145, 1952, p. 478.

Referencing the State's history resources inventory: "Lake Elsinore was known as Etengvo Wumoma to the Indians, Laguna Grande to the Mexicans, and became Lake Elsinore in 1884 when Margaret Collier Graham, wife of one of the town's founders and sister of another named it Elsinore, 'not from the small city so named in Denmark, but rather from the immortality given it by Shakespeare and Campbell; and because it had a pleasant sound.'"[9] As illustrated in Figure E.4–1 (1901 USGS Topographic Quadrangle), the name "Elsinore Mountains" appears on the 1901 USGS topographic quadrangle. Two of the pioneering families of the Elsinore Mountains were those of James H. Stewart and Bud Morrell. Around the turn of the century, James Stewart established a homestead in the Elsinore Mountains. The Morrell family homesteaded a ranch (Section 26, T6S). The Stewart and Morrell families were united when Stewart's daughter (Charlotte) married Bud Morrell's son (Arthur). Decker Canyon was named for another local pioneer.

The City of Lake Elsinore was incorporated in 1888. At that time, the town had a population of approximately two thousand people, with two banks, two hotels, two bathhouses, a water supply system, a schoolhouse, three churches, and a rail connection. In the 1910's and 1920's, the lake became a recreational center, attracting tourists and vacationers from Los Angeles. A lakeshore pavilion was erected in 1912 with the Lake Elsinore Boating and Bathing Resort opened in 1915. In 1924, excavation started for the Southern California Athletic and Country Club on the south shore of the lake, near the intersection of Grand Avenue and the future Ortega Highway. The entire lake and many acres of adjoining land were bought for the development of a golf course and clubhouse. By 1930, the Country Club had fallen into bankruptcy and was turned into a military school in 1933 (Lake Elsinore Naval Academy).

In August 1959, a wildfire ignited in the Elsinore Mountains (Decker Fire) and seven firefighters lost their lives. A monument commemorating these men was erected at the El Cariso Forest Service Fire Station. In their memory, seven small canyons on the north flack of the mountains were named on their behalf (Brooks, Johnson, Harlan, Stinson, Edwards, Guthrie, and Slater).

[9]/ California Department of Parks and Recreation, Historic Resources Inventory, 33-11009, July 26, 1982.

Figure E. 4-1. 1901 USGS Topographic Quadrangle
Source: United States Geological Survey

Cleveland National Forest (CNF) – Trabuco Ranger District. In the late 1860's, an influx of gold miners from northern California descended upon the Santa Ana Mountains. In addition to gold, zinc, lead, and silver were mined. Trees were cut for mine timbers and firewood and great expanses of brush were burned to make way for mineral exploration. Early reports from the 1870’s and 1880’s document uncontrolled fires that burned for weeks at a time. These events caused serious damage to irrigation works and threatened the water supplies of the surrounding rural areas and coastal towns. In response, the California Forestry Commission, established by Governor Stone in 1886, voiced the necessity for special protection of the watershed to prevent fires and subsequent erosion.

The Forest Reserve Act, signed by President Benjamin Harrison in 1891, was intended to curb illegal timber cutting, mining, and other wasteful practices. In 1908, President Theodore Roosevelt combined the Trabuco Canyon and San Jacinto Forests to form the CNF. These were some of the earliest forest reserves established. The CNF originally encompassed over 1.9 million acres.

Between the years of 1908 to 1925, several transfers of forest lands to private and public entities significantly reduced the size of the forest. The focus of attention on the forests was for the control of fire and overgrazing on the homestead ranches developed under the Forest Homestead Act of 1906. Today, the Trabuco Ranger District consists of a total of approximately 420,000 acres.

In 1909, Forest Supervisor Harold Marshall included in a status report a description of the growing mountain resort industry and the ability of easier forest access through the automobile would likely make recreation an expanded use. In 1933, President Franklin D. Roosevelt signed the Emergency Conservation Work Act (ECW), which included the creation of the Civilian Conservation Corp (CCC) for unemployed men to expand and develop forest infrastructure. USDA Forest Service personnel supervised CCC crews in the construction of new administrative buildings, guard (fire watch) stations and lookouts, roads, trails and firebreaks, and camping and recreation facilities.

By late June 1933, eight CCC camps had been established in the CNF. Over the nine years of the program, CNF had seventeen recorded CCC camps, including Camp La Cienaga located in Elsinore. The Camp La Cienaga crews built the Tenaja Guard Station (fire warning station) and served as firefighting crews throughout the southland of California. With the opening of the Ortega Highway in 1934, crews created public campgrounds along the highway, including camps in Trabuco Canyon and Tenaja Canyon. The CNF had seventeen recorded CCC camps over the nine years of the program. The permanent camps usually contained 180 to 200 enrollees. The La Cienaga Camp was an all-black crew located in Elsinore. Their primary projects included campground development, construction of truck trails and firebreaks, as well as reforestation. The crews established a temporary work camp in Tenaja Canyon while building the new Tenaja Guard Station in 1934-1936. By 1936, a residence, garage, 30-foot tall water tower, redwood water tank, and pump house were in place.

The opening of the new Ortega Highway in 1934 was spurred by the creation of public campgrounds in Trabuco and Tenaja Canyons. The campground was created next to the new guard station at Tenaja. The Tenaja Station remained open until 1987 when it was closed during a reallocation of manpower, and the Wildomar Fire Station took over responsibility for the area. The Tenaja Station was vacated and the site size was reduced from 106 to 13 acres. The campground has since been closed to public access. In 1984, 39,540 acres of land in the San Mateo Creek upper watershed were designated as the San Mateo Canyon Wilderness.

Field Surveys. Field surveys of the then-existing APE were conducted by Archaeological Associates in August 1996 and January 1997. Based on an expanded APE (as submitted to the Society of Professional Archeologists (SOPA)), additional archaeological surveys of lands and architectural field surveys of accessible buildings were conducted by the Chambers Group in January 2005. The Draft HRMP reveals the current names of each cultural resource and location information associated with sites in the APE. The locations of these cultural resource sites have not been presented herein for the protection of those resources, except to public agencies, Native American groups and organizations, and professional archaeologists.

The Draft HRMP notes that there are 31 previously-recorded resources located in or directly adjacent to the APE. Twenty-one of these resources have not been evaluated for NRHP eligibility. Five of these resources are potentially eligible for listing on the NRHP or appear to be eligible, while four resources are likely not eligible. One of the resources was determined to be "not a site."

Camp Pendleton straddles the boundaries between the ethnohistoric Luiseňo and Juaneňo cultural groups.[10] There are over 500 recorded archaeological sites on Camp Pendleton. Only about one-quarter of those sites have been evaluated for NRHP eligibility. Of those, about 50 sites have been determined eligible for listing on the NRHP (prehistoric sites), one NRHP District (prehistoric village), two NRHP Mexican and American Period Ranchos.[11]

4.2.1. Regional Paleontology

As mapped by Engel,[12] the area is underlain by undifferentiated granitic rock units of the Southern California Batholith, older fanglomerate, and undifferentiated fanglomerate and terrace deposits. The late Jurassic to early Cretaceous granitic rock units of the Southern California Batholith underlie much of the area and are composed of diorite, quartz diorite, granodiorite, and gabbro. Because of their igneous origin, the granitic rock units are unfossiliferous and are of no paleontologic importance.

The older fanglomerate consists of sandstone, siltstone, and tuff. The age of this rock unit is undetermined, although Engel (1959) considered the rock unit to be possibly Miocene in age. Although no fossil remains are recorded from this rock unit, its similarity to rock units that have yielded the fossilized remains of land mammals in other nearby areas suggests a potential for similar fossil remains occurring in areas underlain by this rock unit. The older fanglomerate is considered to be of unknown paleontological importance. The undifferentiated fanglomerate and terrace deposits consist of pebble and cobble conglomerate and arkosic sand. Pleistocene land mammal remains from three previously recorded fossil sites in the general vicinity could be from this rock unit. Some or all of these specimens could be from the alluvium, which, as mapped by Engel (1959), immediately overlies the undifferentiated fanglomerate and terrace deposits and underlies most of the valley floor.

Los Angeles County Museum (LACM) Fossil Site 6059 yielded camel remains near the airstrip at the northeastern corner of Lake Elsinore. Mammoth remains were recovered from California Institute of Technology (CIT) Fossil Site 571 south of Lake Elsinore, and at CIT Fossil Site 572 in the City of Lake Elsinore. These fossil occurrences suggest a potential for similar fossil remains occurring in areas underlain by the undifferentiated fanglomerate and terrace deposits.

4.3. Historic Properties Management Plan

As part of its prior proceeding in Project No. 11858, Applicant prepared a historic properties management plan (HPMP) . This HPMP has been resubmitted with this application.

The HPMP provides evidence of: (1) records search and field reconnaissance surveys; (2) letters verifying contacts with the Native American Heritage Commission (NAHC) to conduct a Sacred

[10]/ Reddy, Seetha and Brewster, Alice, Applying GIS to Archaeological Site Prediction on Camp Pendleton, Southern California, Pacific Coast Archaeological Society Quarterly, Vol. 35. No. 1, p. 8.

[11]/ Berryman, Stan, Cultural Dimensions of Time: New Perspectives on the Archaeology of Camp Pendleton, Southern California, Pacific Coast Archaeological Society Quarterly, Vol. 35. No. 1, p. 3.

[12]/ Engel, René, Geology of the Lake Elsinore Quadrangle, California, Geology and Mineral Resources of the Lake Elsinore Quadrangle, California, California Division of Mines and Geology, Bulletin 146, 1959.

Lands search for the Proposed Project area to identify Traditional Cultural Properties; (3) letter to individuals that needed to be contacted to provide additional cultural resource information for the Proposed Project area; and (4) historic evaluations of structures within the Proposed Project area. As indicated in correspondence from the NAHC, dated February 7, 2005, as included in the HPMP: "A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate Proposed Project vicinity."

As a part of the prior proceeding for Project No. 11858, the Applicant executed a "Programmatic Agreement among the Federal Energy Regulatory Commission and the California Historic Preservation Officers for Managing Historic Properties that May be Affected by Issuing a License to the Elsinore Valley Municipal Water District and The Nevada Hydro Company for the Operation of the Lake Elsinore Advanced Pumped Storage Project in Riverside County, California (FERC No. 11858-002)" (PA), as issued by FERC on February 12, 2007. Listed signatories to the PA included: (1) Milford Wayn Donaldson, California State Historic Preservation Officer; (2) Tina Terrell, Forest Supervisor, USDA Forest Service; (3) Mike Pool, State Director, United States Bureau of Land Management, California State Office; (4) Col. John C. Coleman, Commanding Officer, United States Marine Corps, Marine Corps Base Camp Pendleton; (5) Clay J. Gregory, Regional Director, United States Bureau of Indian Affairs, Pacific Regional Office; (6) Robert Smith, Chairperson, Pala Band of Mission Indians; (7) John Currier, Chairperson, Rincon Band of Mission Indians; (8) Richard Estrada, Chairperson, San Luis Rey Band of Mission Indians; (9) Christobal C. Devers, Chairperson, Pauma/Yuima Band of Mission Indians; (10) Sonia Johnston, Tribal Chair, Juaneno Band of Mission Indians, Acjachemen Nation; (11) Richard Milanovich, Chairperson, Agua Caliente Band of Cahuilla Indians; (12) Tracy Lee Nelson, Chairperson, La Jolla Band of Mission Indians; (13) David Belardes, Juaneno Band of Mission Indians; (14) Anthony Rivera, Chairman, Juaneno Band of Mission Indians, Acjachemen Nation; and (15) Anthony Morales, Tribal Chairperson, Gabrieleno/Tongva Tribal Council of San Gabriel. The California State Historic Preservation Officer has neither executed that programmatic agreement nor expressed written concern with the nature or contents of that agreement.

Because the HPMP discloses the location of sensitive cultural resources located within and in proximity to Proposed Project facilities, the Applicant has not publicly disclose the contents of that document to anyone other than public agencies and accredited archaeologists. In accordance therewith, copies of the draft HPMP and the PA from Project No. 11858 have not been filed in the current proceeding and remain privileged.

4.4. Cultural Resources Regulatory Setting[13]

The following general discussion includes certain Federal, State, and local statutes and regulations that may be most applicable to an understanding of the Proposed Project's regulatory setting with respect to cultural resources.

[13]/ Cultural resource information is confidential under the Archaeological Resource Protection Act of 1979 (16 U.S.C. 470hh) and Protection of Archaeological Resources: Uniform Regulations (36 CFR 296.18).

On February 8, 2007, FERC executed a "Programmatic Agreement among the Federal Energy Regulatory Commission, the Advisory Council on Historic Preservation and the California State Historic Preservation Officer for Managing Historic Properties that may be Affected by Issuing a License to the Elsinore Valley Municipal Water District and The Nevada Hydro Company for the Operation of the Lake Elsinore Advanced Pumped Storage Project in Riverside County, California (FERC No. 11858-02)" (Programmatic Agreement). As stipulated in the Programmatic Agreement, within one year of issuance of the hydropower license, the licensee will file for FERC's approval a final historic properties management plan (Final HPMP) specifying how historic properties will be managed within the area of potential effect (APE), as defined in 36 CFR 800.16(d), during the term of the license.[14] After the hydropower license is issued, but before the Final HPMP has been approved by FERC, the licensee shall consult with the appropriate parties specified in the PA.

Through an approved HPMP, FERC can require consideration and appropriate management of effects on historic properties throughout the term of the license.[15] As stipulated in the Programmatic Agreement, the final HPMP shall be developed by or under the supervision of a person who meets the professional qualifications standards for architectural history and archeology in the "Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines"[16] (Secretary's Standards).

Archaeological Resources Protection Act of 1979. The Federal Archeological Resources Protection Act (16 U.S.C. 470aa-470mm) (ARPA) expands the protections provided by the Preservation of American Antiquities Act of 1906 in protection archaeological resources and sites located on public and Indian lands. The ARPA regulates finds on Federal and Indian lands and seeks to prevent looting and destruction of archeological resources. ARPA defines "archaeological resources" as items of archeological interest over 100 years old and found in an archaeological context on Federal or Indian lands and requires finders to obtain a Federal permit before excavating these objects.

As specified: "Information concerning the nature and location of any archaeological resource for which the excavation or removal requires a permit or other permission under this act or under any other provision of Federal law may not be made available to the public under Subchapter II of Chapter 5 of Title 5 of the United States Code [5 U.S.C. 551 et seq.] or under any other provision of law unless the Federal land manager concerned determined that such disclosure would (1) further the purpose of this act or the act of June 27, 1660 [16 U.S.C. 469-469c], and (2) not create a risk of harm to such resources or to the site at which such resources are located" (16 U.S.C. 470hh).

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[14]/ The "Draft Lake Elsinore Advanced Pumped Storage Project (LEAPS) & Talega-Escondido/Valley-Serrano 500kV Interconnect Project – Historic Properties Management Plan, FERC No. 11858-002-California" (Draft HRMP) was submitted to the Commission in February 2005.

[15]/ Federal Energy Regulatory Commission, Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects, May 20, 2002, p. 1.

[16]/ 48 FR 44716-44740, September 29, 1983.

Preservation of American Antiquities Act of 1906. The Preservation of American Antiquities Act of 1906 (16 U.S.C. 431-433) provides for the protection of historic or prehistoric remains on Federal lands, establishes criminal sanctions for unauthorized destruction or appropriation of antiquities, authorizes the President to declare by proclamation national monuments, and authorizes the scientific investigation of antiquities on Federal lands, subject to permit and regulations.

Federal agencies may withhold any information pertaining to the location of archaeological sites if the agency determines that disclosing such information would put the resource at risk. ARPA specifically excludes such information from a Freedom of Information Act of 1982 (5 U.S.C. 552) filing which includes all archaeological resources, not just those that are NRHP listed or eligible. In recognition of the sensitive nature of known prehistoric and historic resources within the general area, detailed information regarding those resources is not presented herein but has been disseminated to specific State and Federal agencies and tribal organizations.

Native American Graves Protection and Repatriation Act. The Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001-3013) (NAGPRA) provides a process for museums and Federal agencies to return certain Native American cultural items, such as human remains, funerary objects, sacred objects, or objects of cultural patrimony, to lineal descendants and culturally affiliated Indian tribes and Native Hawaiian organizations. NAGPRA includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American cultural items on Federal and tribal lands, and penalties for noncompliance and illegal trafficking.

Protection of Archaeological Resources Uniform Regulations. The Protection of Archaeological Resources Uniform Regulations (36 CFR Part 296) implements provisions of the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa–mm) by establishing uniform definitions, standards, and procedures to be followed by all Federal land managers in providing protection for archaeological resources located on public lands (including National Forest Service (NFS) lands) and Indian lands of the United States. These regulations enable federal land managers to protect archaeological resources, taking into consideration provisions of the American Indian Religious Freedom Act (42 U.S.C. 1996), through permits authorizing excavation and/or removal of archaeological resources, through civil penalties for unauthorized excavation, through provisions for the preservation of archaeological resource collections and data, and through provisions for ensuring confidentiality of information about archaeological resources when disclosure would threaten the archaeological resources (36 CFR 296.1[a]).

Reservoir Salvage Act of 1960. As stipulated under the Reservoir Salvage Act of 1960 (16 U.S.C. 469-469c-1), Federal policy provides for the

> "preservation of historical and archaeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of (1) flooding, the building of access roads, the erection of workmen's communities, the relocation of railroads and highways, and other alterations of the terrain caused by the construction of a dam by any agency of the United States, or by any private person or corporation holding a license issued by any such agency or (2) any alteration of the terrain caused as

a result of any Federal construction project or federally licensed activity or program" (16 U.S.C. 469).

California Government Code (CGC) Sections 25373 and 37361 of the CGC authorizes county and city governments to enact zoning ordinances for the protection and regulation of buildings and structures of special historical value. Section 65860 of the CGC enlarges the scope of those zoning powers to allow those agencies to regulate the use of buildings, structures, and land between business, industry, residential, and open space.

With regard to California Native American traditional tribal cultural places,[17] Senate Bill 18 (SB18), as approved by the Governor on September 29, 2004, stipulates that, subject to the limitations outlined therein, certain tribal consultation and notice requirements shall apply to local governments when adopting or amending general and specific plans. As specified in SB18 and as outlined in the Governor's Office of Planning and Research's "Supplement to General Plan Guidelines – Tribal Consultation Guidelines"[18] (Tribal Consultation Guidelines), prior to adoption or amendment of a general or specific plan, the local government must: (1) notify the appropriate California Native American tribe[19] of the opportunity to conduct consultation for the purpose of preserving or mitigating impacts to cultural places; (2) refer the proposed action to those tribes that are on the NAHC contact list that have traditional lands within the agency's jurisdiction; and (3) send notice of a public hearing, at least ten days prior to the hearing, to tribes that have filed a written request for such notice. Pursuant to Section 65352.3, only if a tribe is identified by the NAHC and the tribe requests consultation after being contacted by a local government, must the local government consult with the tribe on the plan proposal.

California Public Resources Code. Pursuant to Section 5020.1(k) of the Public Resources Code (PRC), a "historic resource" must be listed on a "local register of historical resources." A "local register" is a "list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution." Resources that are listed in a local historic register or deemed significant in a historical resource survey as provided under Section 5024.1(g) of the PRC are to be presumed historically or culturally significant unless "the preponderance of evidence" demonstrates they are not. Section 5020.1 establishes the threshold of "substantial adverse change" as inclusive of demolition, destruction, relocation, or other alteration activities that would impair the significance of the historic resource. Section 5097.5 of the PRC makes it a misdemeanor for anyone to knowingly disturb any archaeological, paleontological, or historical features situated on public lands.

17/ As defined in Sections 4097.9 and 5097.995 of the PRC.

18/ Governor's Office of Planning and Research, Supplement to General Plan Guidelines – Tribal Consultation Guidelines, April 15, 2005.

19/ SB18 defines the term "California Native American Tribe" as "a federally recognized California Native American Tribe or a non-federally recognized California Native American Tribe that is on the contact list maintained by the Native American Heritage Commission." "Federal recognition" is a legal distinction that applies to a tribe's rights to a government-to-government relationship with the federal government and eligibility for federal programs (Source: Governor's Office of Planning and Research, Supplement to General Plan Guidelines – Tribal Consultation Guidelines, April 15, 2005, p. 6).

The California State Office of Historic Preservation (OHP) is mandated under Section 5024.6(n) of the PRC to maintain the state Historic Resources Inventory for planning and to maintain comprehensive records of historic resources pursuant to Federal and State laws. Section 6254.10 of the CGC establishes that the records of the State Historic Resources Inventory relating to archaeological resources are exempt from disclosure requirements of the California Public Records Act (Sections 6250-6270, CGC).

California Code of Regulations. As described in Section 21084.1 of CEQA and Section 15064.5(a)(4) in Title 14 of the California Code of Regulations (CCR), "[t]he fact that a resource is not listed in, or determined to be eligible for listing in, the California Register of Historical Resources [CRHP], not included in a local register of historical resources, or not deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1 shall not preclude a lead agency from determining whether the resource may be a historical resource for purposes of this section."[20] Section 15064.5 establishes general rules for the analysis of historical (including archaeological) resources in order to determine whether a proposed project may have a substantial adverse effect on the significance of that resource. Section 15064.5(a) defines a "historic resource" (relying on the holding in League for Protection of Oakland's Architectural and Historic Resources v. City of Oakland to describe the relative significance of resources listed in the CRHR, listed in a local register or survey or eligible for listing, or that may be considered locally significant despite not being listed or eligible for listing).[21,22]

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[20]/ A "historic resource" includes: (1) a resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR; (2) a resource included in a local register of historical resources, as defined in Section 5020.1(k) of the PRC or identified as significant in a historical resources survey meeting the requirements of Section 5024.1(g) of the PRC, shall be presumed to be historically or culturally significant (pubic agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant); or (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

[21]/ A resource does not need to have been identified previously either through listing or survey to be considered significant under CEQA. In addition to assessing whether historic resources potentially impacted by a proposed project are listed or have been identified in a survey process, lead agencies have a responsibility to evaluate them against the CRHR criteria prior to making a finding as to a proposed project's impacts to historic resources (Section 21084.1, PRC; Section 15064.5[a][3], CCR).

[22]/ Section 15064.5(b) describes those actions that have or that may have substantial adverse effects and include the following: (1) physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired; (2) the significance of an historical resource is materially impaired when a project: (A) demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; (B) demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a "local register" of historical resources pursuant to Section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or (C) demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources, as determined by a lead agency for purposes of CEQA.

California Penal Code. Under the provisions of the California Penal Code (CPC), it is a misdemeanor offense for any person, other than the owner, to willfully damage or destroy archaeological or historical features on public or privately owned land (14 CPC Part 1, Section 622.5).

California Health and Safety Code. Section 7050.5 of the H&SC stipulates that if human remains are discovered during construction, the project owner is required to contact the county coroner.

4.5. Impacts on Cultural Resources

Potential impacts on cultural resources attributable to the proposed generation facilities are discussed in Section 4.5.1. Potential impacts on cultural resources associated with the primary transmission lines are presented in Section 4.5.2. Potential cumulative impacts on cultural resources relating to the Proposed Project (inclusive of both the primary transmission lines and generation facilities) are presented in Section 4.5.4.

4.5.1. Hydroelectric Facilities - Potential Impacts on Cultural Resources

Cultural resource record searches were conducted within a 0.5-mile search radius of Proposed Project generation facilities. Surveys by SWCA's and AE's archaeologists, combined with adequate previous surveys, have resulted in intensive cultural resource surveys for 78.71 percent of the area where generation components are located, including 100 percent of the proposed Decker Canyon Reservoir site. Six cultural resources have been identified within the study area.

- ◊ Four of the resources are prehistoric in age, including bedrock milling sites. NRHP eligibility of these prehistoric cultural resources have not been determined.
- ◊ One of the resources is a historic Bungalow-style residence that has been evaluated as "significant locally" but has not been formally evaluated for NRHP eligibility.
- ◊ Lake Elsinore (P-33-11009) was recorded as a Traditional Cultural Property (TCP) in 1982. Lake Elsinore is important to the Pechanga Band of Luiseño Mission Indians and the Juaneño Band of Mission Indians (Acjachemen Nation) as a part of their traditional homeland and its presence in Luiseño creation songs. The USDA Forest Service considers Lake Elsinore to be eligible for the NRHP.

There are six known cultural resources located within the Proposed Project area. Direct impacts have been identified for all six of these resources. There is also the potential to encounter additional, undiscovered cultural resources during construction. Of those, as a TCP, Lake Elsinore (P-33-11009) has been determined eligible for the NRHP by the USDA Forest Service. The NRHP eligibility of the remaining five known cultural resources have not been determined.

An additional four historic resources have been identified within 0.5 miles of the proposed LEAPS generation facilities. Two are historical residences, one is the Ortega Highway, and the last is a hillside rock alignment (the Elsinore "E" was first aligned and whitewashed in 1923). The rock alignment has been determined eligible for NRHP listing by the USDS Forest Service. Although the Elsinore "E" has been determined NRHP eligible, indirect visual impacts to that resource would not be significant (Class III). Similarly, indirect visual impacts to the portion of

Ortega Highway (P-33-7234) within a 0.5-mile radius of Proposed Project features would not be significant (Class III). Two of the structures are "locally significant" residences.

The Proposed Project's Powerhouse/Hydroelectric facility, Decker Canyon Reservoir, and their associated construction staging areas are underlain by both Quaternary alluvial units and granitic rocks. Granitic rocks have no paleontological resources potential. Quaternary alluvium has a paleontological sensitivity ranging from low-to-high, depending on the age of the sediments. The paleontological sensitivity of the geologic units traversed by linear portions of the Proposed Project is shown in Table E.4–1 (Hydroelectric Facilities – Paleontological Sensitivity). Areas determined to have paleontological sensitivity are located from MPs 0.9 to MP 1.2.

Table E. 4-1. Hydroelectric Facilities - Paleontological Sensitivity

Mileposts	Rock Units	Sensitivity	Fossil Localities
0 – 0.9	Granitic rocks, undividid	None	-
0.9 – 1.2	Quaternary Older Fan/Alluvium	High	-

Source: California Public Utilities Commission

Table E.4–2 (Hydroelectric Facilities – Cultural Resource Impacts) summarizes the potential cultural and paleontological resource impacts of Proposed Project. Applicant's proposed PMEs, all from the HPMP, would serve to mitigate potential cultural resource impacts attributable to the proposed generation facilities.

Table E.4-2. Hydroelectric Facilities - Cultural Resource Impacts

Impact	Description
CR-1	Construction of the project would cause an adverse change to known historic properties
CR-2	Construction of the project would cause an adverse change to unknown significant buried prehistoric and historical archaeological sites or buried Native American human remains.
CR-3	Construction of the project would cause an adverse change to Traditional Cultural Properties.
CR-4	Operation and long-term presence of the project would cause an adverse change to known historic properties.
CR-5	Long-term presence of the project would cause an adverse change to known historic architectural (built environment) resources.
PAL-1	Construction of the transmission line would destroy or disturb significant paleontological resources.

Source: The Nevada Hydro Company, Inc.

Because known cultural resources potentially eligible for the NRHP have been identified in proximity to the Proposed Project, as well as the potential for encountering undiscovered cultural resources, the following impacts could occur during construction or operation.

Impact CR-1: Construction of the project would cause an adverse change to known historic properties.

Avoidance is recommended for all cultural resources. However, if impacts cannot be avoided, impacts to CA-RIV5877, CA-RIV-5878, CA-RIV-7659, and P-33-7221 could be potentially significant but would be mitigable to a less-than-significant level (Class II) through compliance with FERC/USDA Forest Service permit requirements, including the preparation of a final HPMP, and with the implementation of the PMEs described in the HPMP.

Impact CR-2: Construction of the project would cause an adverse change to unknown significant buried prehistoric and historical archaeological sites or buried Native American human remains.

Types of subsurface features that could be encountered within the vicinity of LEAPS include prehistoric resources, such as buried living surfaces, artifact deposits, hearths, burials, and cremations. Historical resources that could be unearthed during construction include refuse pits, privies, and structural foundations.

Table E. 4-3. FERC Environmental Measures - Cultural Resource Impacts

Measure	Description
	Federal Energy Regulatory Commission / USDA Forest Service Final Environmental Impact Statement, Project No. 11858 (January 2007)
CR-1 (EM-16)	Revise the draft HPMP in consultation with the State Historic Preservation Officer (SHPO), Tribes, United States Bureau of Indian Affairs (BIA), the Lake Elsinore Historical Society, and the USFS and file a final HPMP for Commission approval within 1 year of any license issuance.
CR- 2 (EM-17)	Ensure all transmission facilities conform to Avian Power Line Interaction Committee et al. (1996) guidelines, including power lines to reduce risks of bird strikes. The co-applicants should conform to the April 2005 avian protection plan guidelines.
	The Nevada Hydro Company - Protection, Mitigation, and Enhancement Measures Final Environmental Impact Statement, Project No. 11858 (Section 2.3.6)
CR-3 (PME-13)	Consult with the State Historic Preservation Officer (SHPO) at least 180 days prior to commencement of any land-clearing or land-disturbing activities within the project boundaries, other than those specifically authorized in the license, including recreational development at the project. If activity is on National Forest System lands, also consult with the Forest Service at least 180 days prior to commencement of any land-clearing or land-disturbing activities within the project boundaries, other than those specifically authorized in the license, including recreational development at the project.
CR-4 (PME-14)	If previously unindentified archaeological or historic properties are discovered during the course of constructing or developing the project works or other facilities at the project, stop all land-clearing and land-disturbing activities in the vicinity of such properties and consult with the SHPO or take such alternative actions as may be authorized by the SHPO. Also consult with the Forest Service if a previously unidentified archeological site or historic property is identifies on National Forest System lands.
CR-5 (PME-15)	Implement measures proposed in the draft "Historic Properties Management Plan" (HPMP) developed in consultation with the SHPO and the Forest Service and filed with the Commission, including provisions for the following: (1) completing pre-construction archaeological surveys in the area of potential affect (APE); (2) determining the need for intensive surveys; (3) monitoring archaeological sites and building during construction; (4) appointing a Tribal liaison; (5) studying the potential effects of ground acceleration on historic buildings; (6) developing a program to monitor archaeological sites for five years; and (7) developing a public interpretation program.

Measure	Description
CR-6 (PME-16)	Prepare any recovered fossil remains to the point of identification and prepare them for curation by the Los Angeles County Museum or San Bernardino County Museum.
CR-7 (PME-G)	The Applicant, before starting any land-clearing or land-disturbing activities within the project boundaries, other than those specifically authorized in this license, including recreation development at the project, shall consult with the SHPO. If the Applicant discovers previously unidentified archaeological or historic properties during the course of constructing or developing the project works or other facilities at the project, the Applicant shall stop all land-clearing and land-disturbing activities in the vicinity of the properties and consult with the SHPO. In either instance, the Applicant shall file for FERC approval a cultural resource management plan prepared by a qualified cultural resource specialist after having consulted with the SHPO. The plan shall include the following items: (1) a description of each discovered property indicating whether it is listed or eligible to be listed on the NRHP; (2) a description of the potential effect on each discovered property; (3) proposed measures for avoiding or mitigating effects; (4) documentation of the nature and extent of consultation; and (5) a schedule for mitigating effects and conducting additional studies. FERC may require changes in the plan. The Applicant shall not begin land-clearing or land-disturbing activities, other than those specifically authorized in this license, or resume such activities in the vicinity of a property discovered during construction, until informed by the Commission that the requirements of this article have been fulfilled.
CR-8 (PME-H)	Paleontologic monitoring of earthmoving will be conducted on a half-time or, in the judgment of the vertebrate paleontological monitor, on a less frequently basis in areas underlain by older fanglomerate and undifferentiated fanglomerate and terrace deposits. Freshly exposed sediment/rock and debris will be inspected for larger fossil remains and sediment samples will be test screened periodically for smaller fossil remains. If fossil remains are found by the paleontologist, earthmoving will be temporarily diverted around the resource site until the remains and/or a sediment sample (not to exceed 6,000 pounds) from the fossil-bearing rock unit has been removed and earthmoving allowed to proceed through the site by the paleontologist.
CR-9 (PME-I)	Any recovered fossil remains will be prepared to the point of identification and identified to the lowest taxonomic level possible by a knowledgeable paleontologist. The remains will then be curated and catalogued by a laboratory technician. The remains, along with associated specimen and corresponding geologic and geographic site data, will then be accessioned into the Los Angeles County Museum or San Bernardino County Museum fossil collection where they will be stored, maintained, and made available for future study by qualified investigators, subject to the policies and procedures of those institutions.

Source: The Nevada Hydro Company, Inc.

Buried archaeological resources may be encountered during vegetation removal, grading, and excavation. Impacts to most unknown significant prehistoric and historic archaeological sites could be potentially significant but would be mitigable to a less-than-significant level. Construction effects, if any, relating to Native American human remains would not be significant because Applicant proposes to prepare a discovery plan to be implemented in the event of an unintended discovery. PMEs are as set forth in the HPMP.

Impact CR-3: Construction of the project would cause an adverse change to Traditional Cultural Properties.

Lake Elsinore serves at the lower reservoir for the Proposed Project. Lake Elsinore (P-33-11009) was recorded as a TCP in the State inventory in 1982. Lake Elsinore is viewed by the Pechanga Band of Luiseño Mission Indians and the Juaneño Band of Mission Indians (Acjachemen Nation) as a part of their traditional homeland and it is present in Luiseño creation songs. The USDA Forest Service considers Lake Elsinore eligible for listing on the NRHP.

During the Project No. 11858 proceeded, FERC initiated government-to-government consultation under Section 106 of the NHPA with appropriate Native American groups and provided notification to other public groups regarding the potential effects on traditional cultural values. Ongoing consultation under the current proceeding will determine whether there are other TCPs that could be adversely affected. PMEs, if required, are as set forth in the HPMP.

Impact CR-4: Operation and long-term presence of the project would cause an adverse change to known historic properties.

There are two "locally significant" historical residences within a 0.5-miles radius of Proposed Project facilities and a third (Lake Elsinore) that may be NRHP eligible. Those residents and the lake are potentially subject to long-term and operational impacts caused by the proposed generation facilities.

Direct and indirect impacts could occur to historic properties within the vicinity of the proposed generation facilities during operation of the Project and throughout the facility's operational life. Direct impacts to known resources or other newly identified resources could result from the facility's operation, maintenance, or repair activities. Indirect impacts, such as erosion, could also adversely affect historic properties. These impacts could be potentially significant but would be mitigable to a less-than-significant level through the implementation of those site protection measures and monitoring procedures presented in the HPMP.

Impact CR-5: Long-term presence of the project would cause an adverse change to known historic architectural (built environment) resources.

Three historic built-environment resources, located within a 0.5-mile radius of the Proposed Project, are potentially subject to long-term visual impacts. Each of these resources has been determined "locally significant" but have not been formally evaluated for NRHP eligibility. Any the HPMP impact to these locally significant resources would be mitigated through implementation of the HPMP.

Impact PAL-1: Construction of the project would destroy or disturb significant paleontological resources.

The potential for the discovery of paleontological resources during construction of the Proposed Project ranges from zero-to-high. The discovery, removal, damage, or alteration to paleontological resources could be potentially significant but would be mitigable to a less-than-significant level through the HPMP .

4.5.2. Potential Impacts on Cultural Resources of Primary Transmission Lines

Cultural resources record searches were conducted for the primary transmission line and access roads within a 0.5-mile search radius. Previous surveys conducted on behalf of the Applicant, in combination with new surveys by SWCA Environmental Consultants' (SWCA) and Applied Earth Works' (AE) archaeologists, resulted in intensive cultural resource surveys for the alignment of the previously proposed primary transmission lines.

However, the revised primary transmission line will now be located entirely on or parallel to pre-disturbed areas and will follow under or in close proximity to existing roads in the City of Lake Elsinore and Riverside County to the interconnection with Alberhill Substation proposed by Southern California Edison. Due to this change, impacts on Cultural Resources associated with the primary transmission line have virtually been avoided.

Table E. 4-4 Primary Transmission Lines – Cultural Resource Impacts summarizes the potential cultural and paleontological resource impacts of the primary transmission lines. The primary transmission lines are examined below.

Table E. 4-4 Primary Transmission Lines – Cultural Resource Impacts

Impact	Description
CR-1	Construction of the project would cause an adverse change to known historic properties.
CR-2	Construction of the project would cause an adverse change to unknown significant buried prehistoric and historical archaeological sites or buried Native American human remains.
CR-3	Construction of the project would cause an adverse change to Traditional Cultural Properties.
CR-4	Operation and long-term presence of the project would cause an adverse change to known historic properties.
CR-5	Long-term presence of the project would cause an adverse change to known historic architectural (built environment) resources.
PAL-1	Construction of the primary transmission line would destroy or disturb significant paleontological resources.

Source: The Nevada Hydro Company, Inc.

Because known cultural resources that are potentially eligible for the NRHP exist within the primary transmission lines corridors, as well as the potential for encountering undiscovered cultural resources, the following impacts could occur during construction or operation.

Impact CR-1: Construction of the project would cause an adverse change to known historic properties.

Adverse construction impacts to any known resources could be potentially significant but would be mitigated to a less-than-significant level with the implementation of Applicant's proposed mitigation measures from the HPMP.

If, prior to or during ground-disturbing activities or as a result of the operation of the primary interconnection lines, items of potential cultural, historical, archaeological, or paleontological value are reported or discovered or a known deposit of such items is disturbed on NFS lands, the Applicant shall immediately cease work in the area affected. The Applicant shall then: (1) consult with the SHPO and the USDA Forest Service, if items are found on NFS lands, about the discovery; (2) prepare a site-specific plan, including a schedule, to evaluate the significance of the find and to avoid or mitigate any impacts to sites found eligible for inclusion in the NRHP; (3) base the site-specific plan on recommendations of the SHPO, the USDA Forest Service, and Secretary of the Interior's "Standards and Guidelines for Archaeology and Historic Preservation"; (4) file the site-specific plan for FERC approval, together with the written comments of the SHPO and the USDA Forest Service; and (5) take the necessary steps to protect the sites from further impact until informed by FERC that the requirements have been fulfilled.

Impact CR-2: Construction of the project would cause an adverse change to unknown significant buried prehistoric and historical archaeological sites or buried Native American human remains.

Types of subsurface features that could be encountered include prehistoric resources, such as buried living surfaces, refuse deposits, hearths, burials, and cremations. Historical resources that could be unearthed during construction include refuse pits and privies. Buried archaeological resources may be encountered during vegetation removal at tower and pull site locations, grading of access roads, or excavation associated with tower, substation, and switchyard construction. The discovery, removal, damage, or alteration to known or unknown prehistoric or historic archaeological sites could be potentially significant but would be mitigable to a less-than-significant level with the implementation of the HPMP.

Impact CR-3: Construction of the project would cause an adverse change to Traditional Cultural Properties.

Lake Elsinore is viewed by the Pechanga Band of Luiseño Mission Indians and the Juaneño Band of Mission Indians (Acjachemen Nation) as a part of their traditional homeland and its presence in Luiseño creation songs. Lake Elsinore (P-33-11009) was recorded in the State inventory in 1982 and the USDS Forest Service considers it eligible for listing on the NRHP.

During the Project No. 11858 proceeding, the Applicant, acting under FERC authorization and pursuant to the provisions of 36 CFR 800.2(c)(4), had initiated government-to-government consultation under Section 106 of the NHPA with appropriate Native American groups and provided notification to other public groups regarding potential effects on traditional cultural values. Applicant intends to reinitiate consultation with these groups to confirm the results of prior consultation and to determine whether there are other TCPs that could be adversely affected.

Although some facilities, including the Santa Rosa Substation, may be visible from the lakeshore, the separation distance and underground installation are such as to place the primary transmission lines out of sight of any such viewshed. As a result, the primary transmission line will not result in a significant impact on a TCP. As noted, the applicant intends to use the HPMP as the single PME for cultural and historic resources

Impact CR-4: Operation and long-term presence of the project would cause an adverse change to known historic properties.

Direct and indirect impacts could occur to historic properties within and in the vicinity of the primary transmission line during operation and throughout the facility's operational life. Any known archaeological sites and other yet to be discovered archaeological sites that are determined HRHP-eligible would also potentially be subjected to long-term and operational impacts. Direct impacts to these resources or other newly identified resources could result from maintenance or repair activities.

Indirect impacts, such as erosion, could also adversely affect historic properties. These impacts could be potentially significant but would be mitigable to a less-than-significant level through implementation provisions of the HPMP.

Impact PAL-1: Construction of the project would destroy or disturb significant paleontological resources.

Depending upon the area impacted, the potential for the discovery of paleontological resources during construction of the primary transmission line ranges from zero-to-low. The discovery, removal, damage, or alteration to paleontological resource sites could be potentially significant but would be mitigable to a less-than-significant level through implementation of provisions of the HPMP.

4.5.3. Project - Cultural Resources

The cumulative cultural resource impacts resulting from the implementation of the Project (inclusive of both transmission and generation) would be similar to the combined effects presented in those preceding sections.

BLUEWATER
RENEWABLE ENERGY STORAGE

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E
ENVIRONMENTAL REPORT
SECTION 5 – REPORT ON SOCIO-ECONOMIC IMPACTS

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

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5.0 REPORT ON SOCIO-ECONOMIC IMPACTS

5.1 INTRODUCTION

- As required under 18 CFR 4.41(f)(5): "The applicant must provide a report which identifies and quantifies the impacts of constructing and operating the proposed project on employment, population, housing, personal income, local governmental services, local tax revenues and other factors within the towns and counties in the vicinity of the proposed project." The environmental report must include the information outlined below. To facilitate review, the related section or sections of this exhibit wherein that information is, in part, addressed, is identified in *italics*.
- Description of the socio-economic impact area (*Subsection 5.2.1*);
- Description of employment, population and personal income trends in the impact area (*Subsection 5.2.2*);
- Evaluation of the impact of any substantial in-migration of people on the impact area's governmental facilities and services, such as police, fire, health and educational facilities and programs (*Subsection 5.2.3*);
- On-site manpower requirements and payroll during and after project construction, including a projection of total on-site employment and construction payroll provided by month (*Subsection 5.2.4*);
- Numbers of project construction personnel who: (A) Currently reside within the impact area; (B) Would commute daily to the construction site from places situated outside the impact area; and (C) Would relocate on a temporary basis within the impact area (*Subsection 5.2.5*);
- Determination of whether the existing supply of available housing within the impact area is sufficient to meet the needs of the additional population (*Subsection 5.2.6*);
- Numbers and types of residences and business establishments that would be displaced by the proposed project, procedures to be utilized to acquire these properties, and types and amounts of relocation assistance payments that would be paid to the affected property owners and businesses (*Subsection 5.2.7*); and
- Fiscal impact analysis evaluating the incremental local government expenditures in relation to the incremental local government revenues that would result from the construction of the proposed project. Incremental expenditures may include, but are not be limited to, school operating costs, road maintenance and repair, public safety, and public utility costs (*Subsection 5.2.8*).

In the derivation of this section, extensive consultation has occurred between the Applicant and other Federal, State, and local governmental entities with jurisdiction over the general project area or special expertise regarding the proposed project's potential socio-economic impacts. That consultation has included, but was not limited to, discussions with representatives of or transmittal of project documentation to the United States Department of Agriculture – United States Forest Service, the Southern California Association of Governments, the County of Riverside, and the City of Lake Elsinore.

5.2 36 CFR 4.41(f)(5) REQUIREMENTS

The following material is presented in response to the informational requirements outlined in 18 CFR 4.41(f)(5) and is provided in a format consistent with those requirements.

5.2.1 Description of the Socio-Economic Impact Area

Three distinct geographic areas have been identified as the basis for identifying the socio-economic characteristics of the proposed project. Those areas provide an overall hierarchy against which the project's socio-economic impacts can be evaluated and include the State of California, the County of Riverside, and the City of Lake Elsinore. Each of the three selected socio-economic impact areas is individually described below.

State of California. A brief evaluation of the State provides a comparison between the socio-economic characteristics of the other subordinate geographic areas. California consists of approximately 1,990 square miles (99,813,950 acres), making it the third largest state in the country. With a population of nearly 35 million people as of January 2001, the State contains about 12.2 percent of all United States residents and accounts for about 13.4 percent of the nation's gross domestic product. California's gross domestic product ($1.359 trillion) ranked the State's economy as the fifth largest in the world in 2001, falling behind only the United States ($10.171 trillion), Japan ($4.245 trillion), Germany ($1.874 trillion), and the United Kingdom ($1.406 trillion).1

California is "[o]ften referred to as an ecological island, separated by high mountains from the rest of the continent, California's diversity is the product of the state's variability of landforms, climate, and soil types. This physical complexity has fostered development of an array of specialized habitat types and has been the principal driver in the evolution of a highly distinctive flora and fauna. ."2

Over a 15-year period beginning in 1985, the State's total energy consumption increased by about 21 percent while the State's economy, expressed as Gross State Product (GSP), has grown at a rate of 57 percent. As a result, the amount of energy used to create one dollar of GSP has steadily followed a downward trend. In other words, the State's economy has become more energy efficient. A major reason for the declining energy trend relative to GSP is that California's economy has shifted over the past two decades from one in which manufacturing industries were dominant to one which is increasingly becoming services oriented. Services-oriented industries generally consume less energy per GSP than manufacturing industries.3

Riverside County. The County of Riverside is one of six counties within the jurisdiction of the Southern California Association of Governments (SCAG). The SCAG region includes the Counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. Because the SCAG region encompasses the totality of several counties located well beyond the area of the project's potential influence and because the SCAG area combines both Riverside and San Bernardino Counties as one metropolitan statistical area (MSA), the SCAG region was not considered as an appropriate socio-economic impact area. Socio-economic data for the Counties of Riverside and San Bernardino, as generated by SCAG, is often consolidated such that it is not possible to separate data and trends within that two-county area.

Riverside County is the fourth largest county in California, with more than 7,300 square miles (4,612,740 acres) of land, stretching nearly 200 miles from east to west. With a population of nearly 1.6 million as of January 2001, the County contains about 4.6 percent of all State residents. The County has been identified as one of the fastest growing counties in California, with most of the growth and associated development is occurring in the western portion of the County.

1/ California Department of Finance, Miscellaneous Economic Data, Top Countries Ranked by its Gross Domestic Product, 2001.

2/ Stein, Bruce A., States of the Union: Ranking America's Biodiversity, NatureServe, August 2002, p. 7.

3/ *Op Cit*., Environmental Protection Indicators for California, p. 16.

The westerly portions of Riverside and San Bernardino Counties comprise what is commonly referred to as the "Inland Empire" and represent one of the fastest growing regions in the State. Riverside and San Bernardino Counties have shown the healthiest economic growth in the SCAG region. While the average unemployment rate increased to 5.6 percent in 2002, up from 5.0 percent in 2001, this performance is still better than that of the other counties in the region. After gaining 40,700 payroll jobs in 2001, the two counties together added another 23,600 jobs in 2002. Services and trade added 8,800 and 2,800 jobs, respectively. Construction, finance, insurance, and real estate showed job increases. As indicated by SCAG: "A rapidly growing population continues to provide the momentum for significant growth in the Inland Empire."4

As further indicated by SCAG: "During 2001, Southern California's population grew by approximately 350,000 to a total of over 17 million people. The rate of the region's population growth was a little faster than that of the state. Within the region, Riverside County had the fastest growth rate of 3.8 percent while Los Angeles County had the largest population increase of 170,000. The region's population increase of 350,000 in 2001 was higher than the average annual increase for any decade since 1950 and well above the average annual increase of approximately 190,000 during the 1990s. The geographic distribution of population growth within the region has changed significantly since 1950. Over the years, the Inland Empire has consistently increased its share of the region's total population growth. From 1950 to 1960, the Inland Empire attracted less than 13 percent of the region's growth. However, during the 1980s and 1990s, the population increase in the Inland Empire accounted for approximately 34 percent of the region's growth. Since 1980, the Inland Empire has been the fastest growing area in California."5

With regards to the Inland Empire, as indicated by the Los Angeles County Economic Development Department: "After seeing economic growth forge ahead during difficult economic times in 2001-02, the two-county area should see continued gains in 2003 and 2004. The area has been leading the state in new homebuilding and should easily maintain this position in 2003. In addition, the area's manufacturing sector took only a glancing blow from the recession."6

City of Lake Elsinore. The "County of Riverside Comprehensive General Plan" has divided the County into twelve separate land-use planning areas (LUPAs). The proposed project predominately lies within the "Southwest Territory Planning Area" (STPA). The STPA consists of the incorporated (i.e., Cities of Lake Elsinore, Murrieta, and Temecula) and unincorporated (i.e., Alberhill, Wildomar, Lakeland Village) areas.

The County has initiated a comprehensive update of its current general plan. As part of that planning effort, the existing LUPAs will be revised and the County will likely be divided (for planning purposes) into nineteen area plan boundaries. With the exception of those facility components extending into San Diego County and those located within the National Forest, all of the project's proposed facilities would then be located within the boundaries of the "Elsinore Area Plan." Because the County has elected to modify or now seeks to modify the geographical area in which the proposed project is predominately located, the STPA was not considered a viable socio-economic impact area. Similarly, pending adoption of the revised general plan, the "Elsinore Planning Area" may be subject to further changes and refinements. As a result, that County proposed planning area was not considered a viable socio-economic impact area.

4/ Southern California Association of Governments, Regional Economic Forecast for Southern California, 2003-2004, November 2002, p. 10.

5/ Chang, Ping, The State of the Region 2002 – Measuring Progress in the 21st Century, Southern California Association of Governments, December 2002, p. 9.

6/ Keyser, Jack, *et al*., 2003-2004 Economic Forecast and Industry Outlook for California & the Los Angeles Five-County Area Including the National & International Setting, Los Angeles County Economic Development Corporation, Economic Information & Research Department, February 2003, p. 33.

A significant portion of the proposed hydropower project exists within the City of Lake Elsinore and its adopted sphere of influence (SOI). It is likely those areas would experience the greatest potential socio-economic impacts. As a result, the City has been selected as the third socio-economic impact area.

A profile of economic characteristics, comparing the State, the County of Riverside, and the City of Lake Elsinore, are presented in Table E.5-1. As indicated therein, the County lags behind the State and the City lacks behind the County in many economic indicators. This is particularly evident with regards to median household income, median family income, and percentage of population below poverty levels.

5.2.2 Description of Employment, Population, and Personal Income Trends

The three socio-economic impact areas (i.e., State of California, County of Riverside, City of Lake Elsinore) are separately described below.7

5.2.2.1 State of California.

According to 2000 census data, California had the largest population increase in the United States, increasing by 13.6 percent or almost four million people, over 1990 census data. California's 33.9 million residents make it the most populous state in the country, accounting for 12 percent of the nation's total population. In 2000, California had 217.2 people per square mile (173 percent higher than the national average of 79.6), up from 191 people per square mile in 1990.8 Statistical data comparing the State of California and the County of Riverside is presented in Table E.5-2.

Although the State's population continues to grow, more people left California in the last half of the 1990's than moved in from other states. More than 1.4 million people in the United States migrated to California from 1995 to 2000, while 2.2 million left. Only New York State, which lost 874,000 more residents to other states that it took in, had a bigger net decline than California, which lost about 755,000 residents through net migration. A June 2003 report from the California Department of Finance noted that "a greater number of persons annually leave California for other states than enter California from another state" and that this "outward migration trend" has been consistent.9

While all of the State's regions are growing, the sources of population growth or differ between the regions. Over time, a population grows or declines through births, deaths, and migration. Demographers define natural increase as the difference between the number of births and the number of deaths, and they disaggregate migration into international and domestic migration. Table E.5-3 presents the components of change in the State's regions. As indicated therein, contrary to State-wide trends, the Inland Empire experienced the largest net domestic migration anywhere in the State.

Table E.5-1: Profile of Selected Economic Characteristics

Subject	State of California		County of Riverside		City of Lake Elsinore	
	Number	%	Number	%	Number	%
Employment Status						
Population 16 years and over	25,598,144	100.0	1,124,807	100.0	19,701	100.0

[7] Any inconsistencies in the information cited is based on the derivation of information from a variety of sources. Sources can differ with regards to their assumptions, calendar dates, geographic areas, and methodologies.

[8] United States Census Bureau, Table 1 (Land Area, Population, and Density for States and Counties: 1990), 1990 Census.

[9] California Department of Finance, California Current Population Survey Report, March 2002 Data, Demographic Research Unit, June 2003, p. 18.

Subject	State of California		County of Riverside		City of Lake Elsinore	
	Number	%	Number	%	Number	%
In labor force	15,977,879	62.4	654,387	58.2	12,268	62.3
Civilian labor force	15,829,202	61.8	651,952	58.0	12,218	62.0
Employed	14,718,928	57.5	602,856	53.6	11,352	57.6
Unemployed	1,110,274	4.3	49,096	4.4	866	4.4
Armed Forces	148,677	0.6	2,435	0.2	50	0.3
Not in labor force	9,618,265	37.5	470,420	41.8	7,433	37.7
Occupation						
Management, prof., and related occupations	5,295,069	36.0	167,739	27.8	2,488	21.9
Service occupations	2,173,874	14.8	105,446	17.5	1,806	15.9
Sales and office occupations	3,939,383	26.8	163,095	27.1	3,300	29.1
Farming, fishing, and forestry occupations	196,695	1.3	9,499	1.6	67	0.6
Const., extraction, and maint. occupations	1,239,160	8.4	70,974	11.8	1,698	15.0
Prod., transp., and material moving occupations	1,874,747	12.7	86,103	14.3	1,993	17.6
Industry						
Agricult., forestry, fishing and hunting, & mining	282,717	1.9	13,063	2.2	101	0.9
Construction	915,023	6.2	55,751	9.2	1,415	12.5
Manufacturing	1,930,141	13.1	72,837	12.1	1,899	16.7
Wholesale trade	596,309	4.1	21,400	3.5	493	4.3
Retail trade	1,641,243	11.2	76,466	12.7	1,657	14.6
Transportation and warehousing, and utilities	689,387	4.7	31,683	5.3	636	5.6
Information	577,463	3.9	13,956	2.3	244	2.1
Finance, insur., real estate, and rental & leasing	1,1016,916	6.9	34,348	5.7	469	4.1
Prof., scientific, management, administration, and waste management services	1,711,625	11.6	51,577	8.6	836	7.4
Educational, health and social services	2,723,928	18.5	113,407	18.8	1,574	13.9
Arts, entertainment, recreation, accommodations and food services	1,204,211	8.2	59.131	9.8	981	8.6
Other services (except public administration)	761,154	5.2	30,166	5.0	721	6.4
Public administration	668,811	4.5	29,071	4.8	326	2.9
Class Of Workers						
Private wage and salary workers	11,257,393	76.5	456,252	75.7	9,342	82.3

Subject	State of California		County of Riverside		City of Lake Elsinore	
	Number	%	Number	%	Number	%
Government workers	2,158,071	14.7	93,494	15.5	1,183	10.4
Self-employed workers in own not incorp. busin.	1,249,530	8.5	50,874	8.4	803	7.1
Unpaid family workers	53,934	0.4	2,236	0.4	24	0.2
Income In 1999						
Households	11,512,020	100.0	506,781	100.0	8,872	100.0
Less than $10,000	967,089	8.4	43,183	8.5	942	10.6
$10,000 to $14,999	648,780	5.6	32,150	6.3	603	6.8
$15,000 to $24,999	1,318,246	11.5	67,446	13.3	1,174	132.
$25,000 to $34,999	1,315,085	11.4	62,801	12.4	1,045	11.8
$35,000 to $49,999	1,745,961	15.2	82,700	16.3	1,287	14.5
$50,000 to $74,999	2,202,873	19.1	100,840	19.9	1,934	21.8
$75,000 to $99,999	1,326,569	11.5	56,058	11.1	986	11.1
$100,000 to $149,999	1,192,618	10.4	41,953	8.3	738	8.3
$150,000 to $199,999	385,248	3.3	9,840	1.9	60	0.7
$200,000 or more	409,551	3.6	9.810	1.9	103	1.2
Median household income (dollars)	47,493	-	42,887	-	41,884	-
Families	7,985,489	100.0	375,207	100.0	7,021	100.0
Less than $10,000	457,118	5.7	20,996	5.6	569	8.1
$10,000 to $14,999	365,527	4.6	17,924	4.8	437	6.2
$15,000 to $24,999	834,317	10.4	44,782	11.9	836	11.9
$25,000 to $34,999	873,396	10.9	45,986	12.3	805	11.5
$35,000 to $49,999	1,207,938	15.1	63,764	17.0	1,039	14.8
$50,000 to $74,999	1,615,410	20.2	81,803	21.8	1,656	23.6
$75,000 to $99,999	1,034,671	13.0	48,086	12.8	884	12.6
$100,000 to $149,999	955,377	12.0	35,532	9.5	643	9.2
$150,000 to $199,999	310,407	3.9	8,389	2.2	49	0.7
$200,000 or more	331,328	4.1	7,945	2.1	103	1.5
Median family income (dollars)	53,025	-	48,409	-	47,563	
Poverty Status In 1999 (below pov. Level)						
Families	845,991	10.6	40,073	10.7	1,034	14.7
Families with female householder	350,138	25.0	16,056	27.6	459	38.3
Individuals	4,706,130	14.2	214,084	14.2	4,916	17.0

Source: United States Census Bureau, DP-3 (Profile of Selected Economic Characteristics), Census Summary File 3 (SF3) – Sample Data

Economic conditions are an important determinant of population change in California and those conditions vary substantially between the State's regions. During the first half of the 1990's, the State lost as many as two million people to other states as California endured its worst recession since the great depression. Job-related reasons are commonly cited as the most important factor in migration between states. Table E.5-4 shows the strong relationship between job growth and population growth.

Table E.5-2: California and Riverside County Statistics

Index	California	Riverside County
Land Area in Square Miles	155,959	7,207
Population	33,871,648	1,545,387
Persons per Square Mile ()	217.2	214.4
2001 Population (Estimate)	34,501,130	1,635,888
Population Percent Change (April 1, 2000-July 1, 2001)	1.9	5.9
Population Net Change (1990-2000)	4,060,221	374,974
Population Percent Change (1990-2000)	13.6	32.0
Population Under 5 Years Old (2000)	2,486,981	121,629
Persons Under 5 Years Old Percent (2000)	7.3	7.9
Population Under 18 Years Old (2000)	9,249,829	468,691
Persons Under 19 Years Old Percent (2000)	27.3	30.3
Population 65 Years Old and Over (2000)	3,595,658	195,964
Persons 65 Years Old and Over Percent (2000)	10.6	12.7
Language Other than English Spoken at Home Age 5+ (2000)	12,401,756	468,833
Language Other than English Spoken at Home Age 5+ Percent (2000)	39.5	32.9
Housing Units (2000)	12,214,549	584,674
Homeownership Rate (2000)	56.9	68.9
Median Value of Owner-Occupied Housing Unit (2000)	$211,500	$146,500
Households (2000)	11,502,870	506,218
Persons per Household (2000)	2.87	2.98
Median Household Money Income (1999)	$47,493	$42,887
Per Capita Money Income (1999)	$22,711	$18,689
Persons below Poverty (1999)	4,706,130	214,084
Persons below Poverty Percent (1999)	14.2	14.2
Civilian Labor Force (1999)	16,585,881	687,847
High School Graduates – Persons Age 25+ (2000)	16,356,157	701,551
High School Graduates – Percentage of Persons Age 25+ (2000)	76.8	75
Bachelor's Degree or Higher – Persons Age 25+ (2000)	5,669,966	155,676
Bachelor's Degree or Higher – Percentage of Persons Age 25+ (2000)	26.6	16.6

Source: Bureau of Economic Analysis, Bureau of Labor Statistics, National Agricultural Statistics Service, National Center for Health Statistics, United States Census Bureau

As indicated in Table E.5-4, regions that had the largest growth rates in jobs also had the largest population growth rates during that same period. Population projections suggest that by 2020 almost 46 million people will call California home.

Baseline data for 2001 shows that the civilian labor force grew by 271,500 individuals over the year, an increase of 1.6 percent, bringing the State's total labor force to over 17 million persons. The annual average unemployment rate increased by 0.4 percent from 4.9 percent in 2000 to 5.3 percent in 2001.[10] By July 2002, the State's unemployment rate was 6.3 percent. In July 2002, there were 1.1 million unemployed Californians with more than half unemployed due to job loss and a quarter re-entering the labor force after a period of absence.[11]

Table E.5-3: Components of Population Change (in thousands)

Region	Births	Deaths	Natural Increase	Net International Migration	Net Domestic Migration
South Coast	2,167	724	1,443	1,233	(1,817)
Bay Area	866	413	452	394	(218)
San Joaquin Valley	533	197	337	157	(25)
Inland Empire	496	189	307	112	152
San Diego	445	170	275	164	(160)
Sacramento Metro	228	106	122	54	89
Central Coast	185	79	106	66	(67)
Far North	127	94	33	21	31
Sierras	15	14	1	1	19
California Total	5,063	1,987	3,076	2,201	(1,996)

Source: Public Policy Institute of California, A State of Diversity – Demographic Trends in California's Regions, in California Counts: Population Trends and Profiles, Volume 3, Number 5, May 2002, p. 7

The State's current industry projections for the period 2000-2010 indicate that total non-farm employment will increase by an estimated 3.2 million jobs or 22.2 percent. A majority of this growth will occur in services, trade, and government industries. Services is the fastest growing industry and is projected to add 1.6 million jobs, an increase of almost 36 percent, with business services accounting for the largest portion of that growth. Projections estimate the trade industry will experience a 20 percent growth, while government is expected to increase by 8 percent during that 10-year period.[12]

The top fifty occupations adding the largest number of jobs will account for over half of all job growth between 2000-2010. Nearly half of all the jobs in the top fifty occupations will require less than one month of on-the-job training, while nearly one-quarter will require at least a bachelor degree. The five occupations adding the greatest number of jobs will be retail sale persons (99,000 jobs), combined food preparation and service workers (90,000 jobs), computer software engineers (80,000 jobs), cashiers (76,000 jobs), and computer support specialists (75,000 jobs). The six occupations with the highest rate of growth will all be computer related. Five of these six occupations will nearly double in size during the forecast period. Nearly 40 percent of all new jobs in the fifty largest growing occupations will pay more than $20/hour. A substantial number of these new jobs will pay even higher wages. Nineteen percent will pay more than $30/hour, while seven percent will pay over $40/hour.[13]

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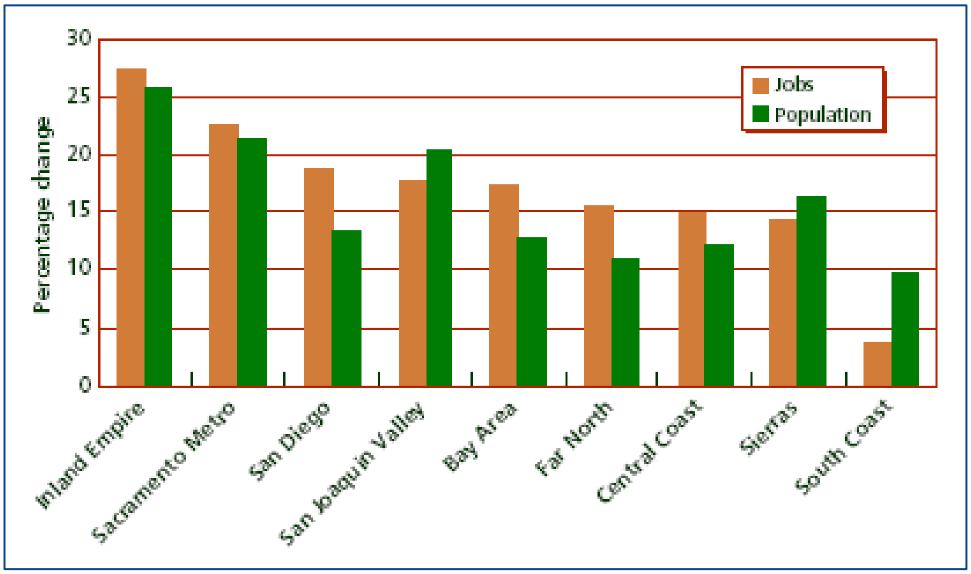
[10]/ California Employment Development Department, County Snapshot – Riverside 2002, undated.

[11]/ California Employment Development Department, A Labor Day Briefing for California, September 2002, pp. 2-3.

[12]/ *Op. Cit*., County Snapshot – Riverside 2002.

[13]/ *Op. Cit*., A Labor Day Briefing for California, pp. 7-8.

Table E.5-4: Ratio of Population Change in Jobs for California's Regions (1990-2000)



Source: Public Policy Institute of California, A State of Diversity – Demographic Trends in California's Regions, in California Counts: Population Trends and Profiles, Volume 3, Number 5, May 2002, p. 8

Despite the State rosy pre-recession projections, California's unemployment rate was 6.7 percent in June 2003. During that month, the number of people unemployed in California was 1,178,000, up by 14,000 compared with June 2002. In a year-over-year comparison (June 2002 to June 2003), non-farm payroll employment in California decreased by 51,300 jobs (a decline of 0.4 percent).[14] As indicated by the SCAG: "Overall, there are no signs that total state employment is about to accelerate."[15] As further indicated by SCAG: "The California economy is tracking the national economy quite closely. As goes the nation, so will go California."[16]

During the past year, California grew at a 1.7 percent rate, adding 591,000 people for the year, to total 35,591,000 on January 1, 2003. This is a slight reduction from the prior year, when the State added 633,000 people and grew 1.8 percent. For the third year, net migration accounts for over half (51 percent) of the State's growth; however, this is a smaller share than in the prior year (53 percent). Revised forecasts, prepared by the California Department of Finance (CDF), are presented in Table E.5-5.

5.2.2.2 County of Riverside.

Between 1990 and 1998, the growth rate in Riverside and San Bernardino Counties was 15.3 percent or higher, more than double the population growth rate for the United States.[17] Between 1994 and 1999, Riverside County grew by over 96,000 people or approximately seven percent. Within the County, two councils of government (COGs) have been established. The eastern portion of the County is within the Coachella Valley Association of Governments (CVAG). The western portion of the County, which encompasses that portion of the proposed project located within the County of Riverside, is within the Western Riverside Council of Governments (WRCOG).

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[14]/ California Employment Development Department, News Release No. 03-34, July 11, 2003.

[15]/ *Op. Cit*., Regional Economic Forecast for Southern California, 2003-2004, p. 5.

[16]/ *Ibid*.

[17]/ Raettig, Terry L., Elmer, Dawn M., and Christensen, Harriet H., Atlas of Social and Economic Conditions and Change in Southern California, General Technical Report PNW-GTR-516, United States Forest Service, September 2001, p. 32.

Table E.5-5: Forecast of Selected California Economic Indicators

Economic Indicator	2002	%Change	Forecast 2003	% Change	2004	%Change
Personal Income ($ billion)	$1,138.7	0.9	$1,173.7	3.1	$1,231.5	4.9
Non-farm Wage & Salary (thousands)	$14,523	-0.7	$14,608	0.6	$14,922	2.1
Mining (thousands)	$ 22	-8.6	$ 21	-4.1	$ 20	-5.0
Construction (thousands)	$ 757	-0.7	$ 765	1.0	$ 787	2.9
Manufacturing (thousands)	$1,738	-7.8	$1,690	-2.7	$1,702	0.7
High Technology (thousands)	$ 442	-12.4	$ 422	-4.4	$ 433	2.5
Transportation/Utilities (thousands)	$ 705	-5.2	$ 706	0.1	$ 722	2.2
Wholesale & Retail Trade (thousands)	$3,348	0.7	$3,419	2.1	$3,539	3.5
Finance Group (thousands)	$ 858	1.7	$ 862	0.5	$ 877	1.8
Services (thousands)	$4,646	-0.2	$4,672	0.6	$4,802	2.8
Government (thousands)	$2,450	2.8	$2,473	0.9	$2,473	0.0
Unemployment Rate	6.7	-	6.6	-	6.4	-
Housing Permits	166	11.5	179	7.8	174	-3.2
Consumer Price Index (1982-84=100)	186.1	2.4	191.5	2.9	196.1	2.4

Notes:

1. Forecast based on data available as of April 2003.

Source: California Department of Finance, California Economic Forecasts

As indicated in Table E.5-6, between 1994 and 1999, the easterly portion grew at a slightly greater pace (i.e., eleven percent) than the westerly portion (i.e., six percent). County unincorporated areas grew by just 1.1 percent, significantly slower than the region or the County as a whole. In comparison, the six-county SCAG region grew by about six percent during that same period. In Riverside County, 2000 census data records the population at 1.5 million, an increase of 32 percent or 375,000 persons over 1990 census data. As of January 1, 2003, the County's population was estimated to be over 1.7 million residents.[18]

Table E.5-6: Regional Population Growth Trends in Riverside County

Area	1994	1999	% Change
Riverside County	1,376,877	1,473,307	7.0
Cities	992,858	1,084,928	9.4
Unincorporated	384,019	388,379	1.1
WRCOG Area	1,082,996	1,147,629	6.0
Cities	768,272	829,332	7.9
Unincorporated	314,724	318,297	1.1
CVAG Area	293,881	325,678	10.8
Cities	224,586	255,596	13.8

[18]/ California Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2003, with 2000 DRU Benchmark, May 2003, Table 1 (E-4 Population Estimates for Cities, Counties and the State, 2001-2003, with 2000 Census Counts, Demographic Research Unit).

Area	1994	1999	% Change
Unincorporated	69,295	70,082	1.1
SCAG Region	15,603,036	16,545,220	6.0
California	31,960,623	33,773,466	5.7

Source: Stanley R. Hoffman Associates, Inc.; SCAG Regional Forecasts; 1998 Regional Transportation Plan, Department of Finance, January 1, 1994-1999.

With regards to continued population growth, Table E.5-7 outlines the regional six-county SCAG region forecast for the period 2000-2020. Although not a part of the COG, SCAG has also developed projections for San Diego County. As indicated therein, the population of Riverside County will grow by an estimated 1,128,200 individuals in absolute numbers, representing a 66.6 percent increase in the County's population over that period. Of the seven counties that comprise southern California, Riverside is the third second fasting growing in term of percentage increase and third fasting growing in terms of total population increase.

The County's profile of business firms and employment is presented in Table E.5-8, with comparisons to the State's economy. Among the 21 primary economic sectors reported by the Census Bureau in 1999, retail trade accounts for the most establishments (16 percent) and employment (16 percent). Manufacturing firms generated the largest share of payroll (17 percent) and second highest employment (14 percent). Construction, accommodations and food service, and health care and social assistance also ranked high in economic activities.

As indicated, relative to the State's economy, Riverside County had much greater activity in the construction sector, reflecting the high level of residential and commercial building activities within the County, and less activity related to professional and technical services. The County's economic mix has changed in several ways since 1994. Construction has grown sharply with jobs doubling from 21,000 to 44,000 jobs and the sector rising from 8 to 12 percent of the total employment.[19]

Table E.5-7: SCAG County Population Projections

County	Population Projections					Growth 2000-20	Percent Growth
	2000	2005	2010	2015	2020		
Imperial	149,000	172,000	207,000	241,000	280,000	131,000	87.92
Los Angeles	9,231,600	9,818,200	10,329,500	10,868,900	11,513,400	2,430,900	24.76
Orange	2,859,200	3,005,800	3,105,300	3,165,400	3,244,600	385,400	13.48
Riverside	1,687,800	1,976,900	2,265,300	2,531,700	2,816,000	1,128,200	66.84
San Bernardino	1,772,500	2,005,400	2,239,600	2,512,700	2,830,100	1,057,600	59.67
Ventura	712,700	744,900	804,300	861,600	932,300	219,600	30.81
SCAG Region	16,999,000	18,234,000	19,491,000	20,826,000	22,352,000	5,353,000	31.49
San Diego	2,911,500	3,223,490	3,437,697	NA	3,853,297	941,797	32.35

Source: Southern California Association of Governments, 1998 Regional Transportation Plan, April 1998

[19]/ Riverside County Transportation Commission, Federal Highway Administration, California Department of Transportation, and County of Riverside, Tier I Draft Environmental Impact Statement/Report for the Hemet to Corona/Lake Elsinore Corridor, August 2002, pp. 3.3-3 and 3.3-4.

Table E.5-8: Riverside County Business Patterns

Economic Sector	Establishments			Employees			Annual Payroll ($ million)		
	Riverside		State	Riverside		State	Riverside		State
	Number	%	%	Number	%	%	Number	%	%
Construction	3,200	12	8	44,028	12	6	1,383	15	6
Manufacturing	1,475	5	6	49,509	14	15	1,584	17	17
Retail Trade	4,217	16	14	59,135	16	12	1,309	14	7
Finance, Insurance	11,173	5	5	9,981	3	5	384	4	8
Prof., Tech. Services	1,967	3	12	10,392	3	8	360	4	11
Health Care, Soc. Asst.	2,692	11	10	42,058	12	10	1,216	13	9
Lodging, Food Service	2,242	9	8	44,618	12	9	561	6	3
All Other Sectors	8,793	34	37	106,637	28	35	3,687	28	39
Total Reported	25,705	100	-	366,358	100	-	9,484	100	-

Source: Riverside County Transportation Commission, Federal Highway Administration, California Department of Transportation, County of Riverside, Tier I Draft Environmental Impact Statement/Report for the Hemet to Corona/Lake Elsinore Corridor, August 2002, Table 3.3B

Both the rate job growth and the number of new employment opportunities within Inland Empire, which includes Riverside County, exceeds that of the region as a whole. As indicated in Table E.5-9, between 1990 and 2000, a total of 274,900 new jobs were created in Riverside and San Bernardino Counties. Between 2001 and 2001, an additional 39,000 wage and salary jobs were created in the Inland Empire.

Table E.5-9: Wage and Salary Employment Growth (in thousands)

County	1990	2000	2001	1990-2000		2000-2001	
				Number	Percent	Number	Percent
Imperial	44.9	50.4	51.6	5.5	12	1.2	2.4
Los Angeles	4,147.1	4,079.8	4,102.1	-67.3	-2	22.3	0.5
Orange	1,178.9	1,396.5	1,425.4	217.6	18	28.9	2.1
Riverside/San Bernardino	735.2	1,010.1	1,049.1	274.9	37	39.0	3.9
Ventura	247.1	294.4	302.5	47.3	19	8.1	2.8
SCAG Region	6,353.2	6,831.2	6,930.7	478.0	8	99.5	1.5
California	12,863.4	14,896.6	15,084.6	2,033.2	16	188.0	1.3

Source: Southern California Association of Governments, The State of the Region– Measuring Progress in the 21st Century

Table E.5-10 presents a forecast of employment trends by occupation for Riverside County to the year 2002. According to information from the CEDD, there is expected to be an increase of 80,100 jobs between 1995 and 2002. The largest increase is anticipated in the professional/ technical and service occupations. While the professional/technical occupations have the second highest annual average wages (i.e., $42,416), the service occupations have the lowest annual average wage (i.e., $16,969).

Data for 2001 showed the civilian labor force for Riverside County to be 750,700 workers, with an unemployment rate of 5.2 percent. This figure is slightly lower than the State's overall rate of 5.3 percent for the same year. The County's diverse economic base is lead by services, retail trades, and government.

The services industry is the largest industry in the County, accounting for 26 percent of the total employment.[20]

According to the California Employment Development Department (CEDD), 93 percent of the job growth between 1990 and 1997 occurred in the "service producing" sector. The fastest growing occupations were in retail trade, health services, and local government. The largest declines were in construction, aerospace manufacturing, and communications and public utilities industries.[21] Industry projections, however, estimate that construction will grow by more than 32 percent between 1999 and 2006, representing an increase of 13,400 jobs.[22]

Table E.5-10: Employment Forecast by Occupation in Riverside County

CA OES Code[1]	Occupational Title	Annual Averages		Absolute Change	Percent Change	Average Hourly Wage($)	Annual Average Wage($)
		1995	2002				
-	Total, All Occupations	338,000	418,100	80,100	23.7	13.61	28,304
100000	Mgrs and Admin Occupations	22,300	27,590	5,290	23.7	25.69	53,445
200000	Professional, Paraprofessional, Technical	64,820	82,830	18,010	27.8	20.39	42,416
400000	Sales and Related Occupations	42,640	49,860	7,220	16.9	11.26	23,417
500000	Clerical, Administrative Support	59,280	68,670	9,390	15.8	11.28	23,456
600000	Service Occupations	63,940	81,920	17,980	28.1	8.16	16,969
700000	Agricultural, Forestry, Fishing	5,800	7,180	1,380	23.8	9.09	18,908
800000	Production, Construction, Operations, Material Handling	79,050	99,830	20,780	26.3	12.42	25,833

Notes:
1. Occupational Employment Statistics, published by the Bureau of Labor Statistics (May 1992).

Source: Stanley R. Hoffman Associates, Inc.; California Employment Development Department; Labor Market Information Division (March 1996 Benchmark Data)

Within the services industry, recent growth is concentrated in personal services, private educational services, and engineering and management services. Industry employment projects for 1999-2006 estimate 31,000 jobs will be added to services over the forecast period. Business services and health services are expected to have the highest gains.[23] In addition, agriculture will continue to remain a significant part of the County's economy. The County currently ranks among the top ten leading agricultural counties in the State, producing a variety of crops (e.g., milk, table grapes, eggs, dates).

Despite the area's promising job prospects, between 1989 and 1995, the Counties of San Bernardino, Imperial, Riverside, San Diego and Orange all had poverty rates well above twice the national rate during that time period. As indicated in Table E.5-11, Riverside County's poverty rate was only slightly better that the State as a whole. Between 1989 and 1995, the percentage of people in poverty in Riverside County increased by more than 32 percent, which was greater than the Statewide increase of under 30 percent.

[20]/ Op. Cit., County Snapshot – Riverside 2002.

[21]/ The Planning Center, Draft County of Riverside Housing Element Update, September 19, 2001, County of Riverside, p. II-7.

[22]/ Op. Cit., County Snapshot – Riverside 2002.

[23]/ *Op. Cit*., County Snapshot – Riverside 2002.

Regional income levels provide some indication of an area's ability to plan for and provide services to growing populations. Over the past three decades, the economic well-being of California's regions, as measured by income, has diverged. In 1969, the wealthiest region of the State (Bay Area) had a per capita income about 10 percent higher than the State as a whole; whereas, the poorest region (San Joaquin Valley) had a per capita income about 20 percent lower than the State average. By 1999, the gap had grown tremendously, with the Bay Area enjoying a per capita income almost 40 percent higher than the State average and the San Joaquin Valley having a per capita income more than 30 percent below the State average.[24] The Inland Empire, based on a measurement of income, has joined the San Joaquin Valley as one of the poorest regions in the State.

Table E.5-11:Poverty Estimates – 1989 TO 1995

Area	1989			1995		
	People in Poverty (%)	Lower (%)	Upper (%)	People in Poverty (%)	Lower (%)	Upper (%)
Riverside County	10.8	8.7	12.8	14.3	11.6	17
San Bernardino County	11.6	9.5	13.7	16.5	13.5	19.5
California	12.7	11.9	13.6	16.5	15.5	17.4

Source: United States Bureau of the Census; Small Area Income and Poverty Estimates: State and County Estimates, 1989, 1993, and 1995

As indicated in Table E.5-12, in inflation-adjusted terms, per capita incomes have declined in the Inland Empire and San Joaquin Valley, whereas they have risen dramatically in the Bay Area. As indicated by the Public Policy Institute of California: "That two of California's fastest growing regions (the San Joaquin Valley and the Inland Empire) have such low and declining incomes is troubling. It suggests that those areas have few resources to successfully plan for and provide for population growth than do other regions that are experiencing far less growth."[25]

As depicted in Table E.5-13, as of January 2001, the County's housing stock totalled 595,682 units, representing about 4.8 percent of all dwelling units throughout the State. In 2000, a total of 148,540 new units were permitted throughout California, including 105,595 single-family (71.1 percent) and 42,945 multi-family (28.9 percent) units, and 15,410 new units were permitted in Riverside County, including 13,630 single-family (88.4 percent) and 1,780 multi-family (11.6 percent) units. During that year, 10.4 percent of all new units permitted in California were permitted in Riverside County.[26] Between 1990 and 2001, the County's percentage of the State's entire housing inventory increased from 4.3 percent to 4.8 percent.

As indicated by the Los Angeles Economic Development Commission (LAEDC): "While it has not set any records, new homebuilding in the state has held at fairly steady levels. Permits for 164,115 units were issued in 2002, and the forecast for 2003 calls for a 2.7 percent increase to 168,500. The Riverside-San Bernardino area should again lead the state in new homebuilding."[27]

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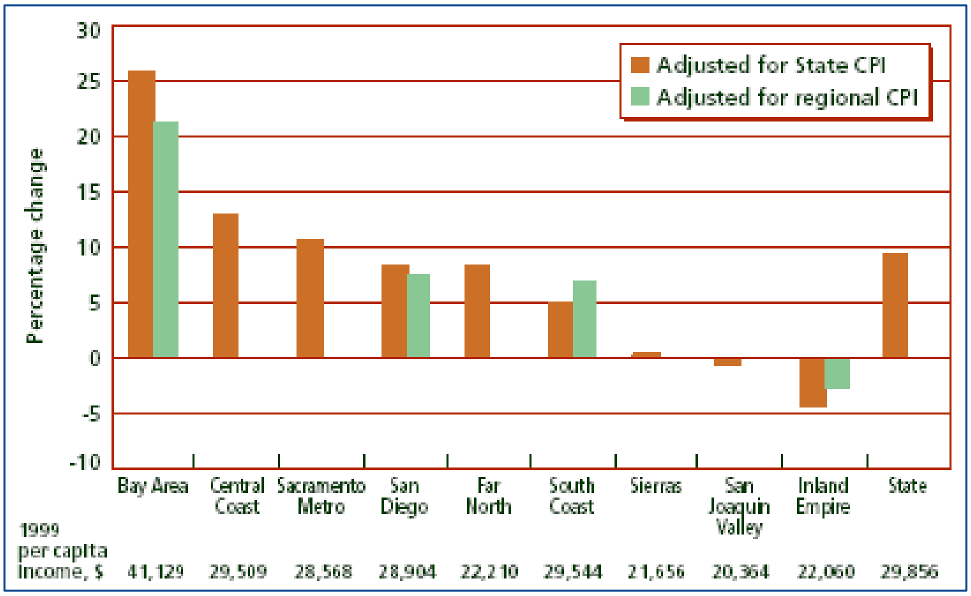
[24]/ Public Policy Institute of California, A State of Diversity – Demographic Trends in California's Regions, in California Counts: Population Trends and Profiles, Volume 3, Number 5, May 2002, pp. 8-9.

[25]/ *Ibid*., p. 9.

[26]/ California Department of Finance, California County Profiles – A Companion to the 2001 California Statistical Abstract, Economic Research, February 2002.

[27]/ *Op. Cit*., 2003-2004 Economic Forecast and Industry Outlook for California & the Los Angeles Five-County Area Including the National & International Setting, p. 16.

Table E.5-12:Percentage Change in Per Capita Income in California's Regions



Source: California Department of Finance, California County Profiles – A Companion to the 2001 California Statistical Abstract, Economic Research, February 2002, p. 10.

Table E.5-13:State of California and County of Riverside Housing Inventory

Area	State of California		County of Riverside	
	April 1990	January 2001	April 1990	January 2001
Housing Stock	11,182,882	12,309,567	483,847	595,682
Percentage of California	-	-	4.3	4.8
Single Family	6,930,949	NA	312,967	NA
Multiple Family	3,571,993	NA	91,222	NA
Mobile Homes, Trailers, Etc.	679,940	NA	76,658	NA
Vacancy Rate	7.2	5.8	16.9	13.4

Source: California Department of Finance, California County Profiles – A Companion to the 2001 California Statistical Abstract, Economic Research, February 2002

Riverside and San Bernardino Counties account for around two-thirds of the region's single-family home construction. The LAEDC[28] notes: "The western portion of Riverside and San Bernardino counties adjacent to L.A. [Los Angeles] and Orange counties, often referred to as the 'Inland Empire,' offers some of the best opportunities for owning a home in the Greater L.A. metro area. This area will continue to see strong homebuilding activity in 2003 thanks to the relative affordability and proximity to the employment centers of L.A. and Orange counties. . .For 2002, an estimated 66,970 housing unit permits were issued in the Los Angeles five-county area, a 16% increase over 2001. Around 69% of the total was single-family homes and 31% was multi-family units such as apartments and condos. The Riverside-San Bernardino are accounted for 50% of all the permits issued. . .The Riverside-San Bernardino area dominated the single-family construction activity (64% share)."[29]

[28]/ The Los Angeles Economic Development Commission's (LAEDC) planning efforts include a five-county area (excluding Imperial County), while SCAG's planning efforts include a six-county area (including Imperial County).

[29]/ *Ibid*., p. 52-53.

Through the region, home prices have risen dramatically over the past few years and will likely continue to rise at a more moderate rate in 2003 and 2004. Such price increases are mostly the natural result of supply and demand. Home prices in the Inland Empire were the most affordable in the southern California area. At $184,200, the typical home costs less than half as much as homes in Orange and Ventura Counties. The area's median price also appreciated the least, at 11.6 percent.

As indicated by the LAEDC: "Calculating the monthly mortgage payments on these median prices allows us to estimate the cost of housing in different areas. Assuming a 20% downpayment and a 6% mortgage interest rate, the monthly mortgage payments (calculated from the median home prices) ranged from $2,081 in Orange County and $1,858 in Ventura County to $1,445 in Los Angeles County and just $883 in the Inland Empire. The difference enables employers in the Inland Empire to offer lower wages and still attract quality employees who live nearby."[30] The average cost of a new home in the Riverside County moved over the $200,000 mark in 1999 and is now close to $270,000.[31]

With regards to apartment rents, San Bernardino County ($880/month) and Riverside County ($871/month) are the most affordable areas, on average. The LAEDC notes: "It should be noted that one can easily afford a house in Riverside or San Bernardino counties for the cost of apartment rent in Los Angeles, Orange, and Ventura counties."[32]

In June 2003, home sales in the southern California region reached their highest June sales totals since 1989. A total of 31,369 new and resale houses and condominiums were sold in Los Angeles, Riverside, San Diego, Ventura, San Bernardino, and Orange Counties during that month. That was down 0.1 percent from 31,387 for the month before, and up 4.4 percent from 30,038 for June 2002. Last month was the strongest June in the region since 1989 when 32,968 homes were sold. In Riverside County 5,303 homes were sold, an all-time high for any month. In San Bernardino County 3,903 homes were sold, slightly off a record 3,940 for the month before.[33]

As indicated in Table E.5-14, the CDF predicts that the Inland Empire will be the fastest growing urban area in California, both in terms of absolute numbers and percentage increase. The County of Riverside is predicted to add 602,682 new residents between 1999 and 2010, increasing the County's population to over 2.1 million people.

Table E.5-14:Ten Fastest Growing California County Areas

Rank	Area	1999	2010	Absolute Change	Change (%)	Average Annual Change
-	Inland Empire	3,212,136	4,313,344	1,101,208	34.3	110,121
1	Los Angeles County	9,884,255	10,604,452	720,197	7.3	72,020
2	Riverside County	1,522,855	2,125,537	602,682	39.6	60,268
3	San Diego County	2,911,468	3,441,436	529,968	18.2	52,997
4	San Bernardino County	1,689,281	2,187,807	498,526	29.5	49,853
5	Orange County	2,828,351	3,163,776	335,425	11.9	33,543

30/ *Ibid*., p. 53.

31/ *Ibid*., p. 34.

32/ *Ibid*.

33/ Dataquick.

Rank	Area	1999	2010	Absolute Change	Change (%)	Average Annual Change
6	Santa Clara County	1,736,722	2,021,417	284,695	16.4	28,470
7	Sacramento County	1,209,472	1,436,286	226,814	18.8	22,681
8	Alameda County	1,454,302	1,654,485	200,183	13.8	20,018
9	Fresno County	805,005	953,457	148,452	18.4	14,845
10	Contra Costa County	930,025	1,025,857	95,832	10.3	9,583

Source: Husing, John, E., City of Lake Elsinore – Demographic, Economic & Quality of Live Data, Economics & Politics, Inc. September 20, 2000

Population growth within the SCAG region has come from the following sources: natural increase (i.e., excess of births over deaths), net domestic migration, and net foreign migration. Since 1990, natural increases have accounted for over 50 percent of the State's population growth. Both types of net migration (i.e., domestic and international) have, however, become important elements in the State's population growth. Since 1970, international in-migration has outpaced net migration from other states.[34]

During the 1990's, the relative contributions among these three sources of population growth changed significantly throughout the region. A defining feature of demographic changes in southern California during the 1990's was the large number (i.e., 1.5 million) of net domestic out-migration, primarily due to 1990 to 1993 recession. During the 1990's natural increase became the largest component of southern California's population growth, partly due to the higher rate of births among the foreign-born population of the region. Riverside County was the only county in the SCAG region where net domestic migration was the largest component of growth.[35]

5.2.2.3 City of Lake Elsinore.[36]

In 1987, a comprehensive land use inventory was undertaken in the City to determine the location and acreage of general land use types. Table E.5-15 presents the approximate distribution of land uses within the City. As indicated, with the exception of park acreage (e.g., Lake Elsinore), residential land use is the major use within the City Residential uses in the City are primarily composed of single-family detached units. Approximately eight percent of the City's residential development is in multi-family housing.

Table E.5-15:City of Lake Elsinore Existing Land Use Distribution

Land Use	Acres	Percent of City	Percent of Developed Area
Single-Family Residential	2,867	17	33
Multi-Family Residential	146	1	2
Mobile Home Park	84	1	1
RV Parks	9	0.05	0.1
Commercial	299	2	3

34/ Lopez, Elias, Major Demographic Shifts Occurring in California, California Research Bureau, CRB Note, Volume 6, Number 5, October 1999, p. 1.

35/ Op. Cit., The State of the Region 2002 – Measuring Progress in the 21st Century, p. 9.

36/ Socio-economic information concerning Lake Elsinore is derived, in part, from "City of Lake Elsinore – Demographic, Economic & Quality of Life Data" prepared by John E. Husing, Ph.D. in September 2000.

Land Use	Acres	Percent of City	Percent of Developed Area
Industrial/Manufacturing	137	1	2
Public/Institutional	664	4	8
Agriculture/Mining	558	3	5.9
Floodplain	154	1	2
State Park	2,973	17	34
Right-of-Way	787	5	9
Vacant	8,395	49	-
Total	17,083	100	100

Notes:

1. Prior to its conveyance to the City, the area of Lake Elsinore was designated as a State Recreational Area.

Source: City of Lake Elsinore

As reported by the 2000 census, the City of Lake Elsinore consists of an area of about 38.78 square miles, of which about 4.97 square miles comprises the lake itself. The population per square mile was reported to be 855.7 individuals. The 2000 census records the City's population as 28,928 persons.

With a January 2001 population of around 30,370 residents, the City of Lake Elsinore is the twelve largest incorporated city in Riverside County. As indicated in Table E.5-16, from 1990-2000, Lake Elsinore grew from 18,316 to 30,370 residents. That 65.8 percent gain was the ninth fastest rate in the Inland Empire. During that same period, Riverside County was the fastest expanding large county in California, growing 30.1 percent.

Lake Elsinore's 12,054 absolute gain in population was the seventeenth largest among the 48 Inland Empire cities and the second largest among urban cities with populations between 25,000-50,000. The City experienced strong population growth throughout the 1990's with annual rates ranging from 2.5 to 13.4 percent. In all but one year, the City's rate of increase exceeded that of the County as a whole.

Lake Elsinore is located in western Riverside County. The broader subregion, which includes the Cities of Corona, Lake Elsinore, Canyon Lake, Hemet, San Jacinto, Perris, and Moreno Valley, comprises an area with a population base of nearly 300,000 individuals and over 170,000 jobs. Table E.5-17 illustrates the year 2000 and projected year 2025 populations and employment for the incorporated and unincorporated areas of western Riverside County, ad provided by the WRCOG. The growth projections show increases in population ranging between 8 and 396 percent and increases in employment ranging between 32 and 436 percent. The greatest percentage increase is in the Cities of Lake Elsinore, Perris, and San Jacinto.[37]

Table E.5-16:City Of Lake Elsinore and County of Riverside Population Changes 1990-2000

Year	City of Lake Elsinore		County of Riverside	
	Population	Percent Increase	Population	Percent Increase
1990	18,316	-	1,170,413	-
1991	19,244	5.1	1,223,227	4.5
1992	21,819	13.4	1,268,844	3.7

[37]/ *Op. Cit.*, Tier I Draft Environmental Impact Statement/Report for the Hemet to Corona/Lake Elsinore Corridor, pp. 1-4 and 1-5.

Year	City of Lake Elsinore		County of Riverside	
	Population	Percent Increase	Population	Percent Increase
1993	22,366	2.5	1,304,447	2.8
1994	23,666	5.8	1,331,988	2.1
1995	24,565	3.8	1,355,571	1.8
1996	25,616	4.3	1,381,781	1.9
1997	26,674	4.1	1,400,384	1.3
1998	27,766	4.1	1,441,237	2.9
1999	29,297	5.5	1,473,307	2.2
2000	30,370	3.7	1,522,855	3.3
Change 1990-2000	12,054	65.8	352,442	30.1

Source: Husing, John, E., City of Lake Elsinore – Demographic, Economic & Quality of Live Data, Economics & Politics, Inc. September 20, 2000.

As indicated in Table E.5- 18, at 6.8 percent, the current (June 2003) unemployment rate in the City of Lake Elsinore exceeds that for the County as a whole.

As indicated in Table E.5-19, the City's average household income was $51,979 and its per capita income was $17,036. Lake Elsinore's income distribution is quite similar to that of Riverside County. The largest percentage of the City's (36.0 percent) and the County's (30.9 percent) families were in the $0-29,999 annual income bracket. The second largest group of City's (25.4 percent) and the County's (27.3 percent) families were in the $45,000-74,999. Only 12.8 percent of City's families and 16.8 percent of the County's families made over $100,000.

Lake Elsinore's families rank in the middle of the income spectrum with regards to other communities within the County. In 1999, the City's 1999 median family income was estimated at $42,425, a little below the $45,421 for Riverside County as a whole. Using this measure, the City ranked twenty-eight among the region's 48 cities.

Table E.5-17:Current and Projected Population And Employment for Cities In Western Riverside County

Areas	Population			Employment		
	2000	2025	Percent Increase	2000	2025	Percent Increase
Banning	23,562	47,328	101	8,387	15,342	83
Beaumont	11,384	56,450	396	4,162	22,291	436
Calimesa	7,139	29,554	314	1,345	5,273	292
Canyon Lake	9,952	10,702	8	1,973	2,875	46
Corona	124,966	156,522	25	45,000	69,905	55
Hemet	58,812	127,899	117	18,344	29,095	59
Lake Elsinore	29,928	81,820	183	7,821	25,562	227
Moreno Valley	142.381	221,343	55	29,860	71,859	141
Murrieta	44,282	96,382	118	7,852	28,205	259
Norco	24,157	30,568	27	9,184	12,140	32
Perris	36,189	109,377	202	11,058	32,300	192

Areas	Population			Employment		
	2000	2025	Percent Increase	2000	2025	Percent Increase
Riverside	255,166	340,328	33	120,915	232,326	92
San Jacinto	23,779	67,115	182	5,968	15,455	159
Temescula	57,716	86,000	49	25,200	46,260	84
Unincorporated	342,568	771,595	125	100,307	192,918	92
Total	1,190,981	2,232,983	87	397,376	801,806	102

Source: Riverside County Transportation Commission, *et al*., Tier I Draft Environmental Impact Statement/ Report for the Hemet to Corona/Lake Elsinore Corridor, August 2002, Table 1.A

Table E.5- 18: Unemployment Rates for California, Riverside County and the City of Lake Elsinore

Area	Labor Force	Employment	Unemployment	Unemployment Rate
California	17,631,000	16,453,000	1,178,000	6.7
Riverside County	816,600	766,900	49,700	6.1
Lake Elsinore	12,480	11,630	850	6.8

Source: California Employment Development Department

Since World War II, southern California has expanded outward along transportation corridors. As land in one area has become saturated and expensive, development has moved to the next place with available space. Today, the aggressive rim of this activity is in the Inland Empire.

For most of the City's history, Lake Elsinore has been a small town whose economic life has been centered around activities at both the lake and the adjoining CNF. The completion of the I-15 Freeway in 1992 and the reduction of residentially zoned land in San Diego and Orange Counties have created conditions that have caused a six-fold increase in the City population in the past two decades.

Table E.5-19:City of Lake Elsinore and Riverside County (Household Income Distribution)

Income Range ($)	City of Lake Elsinore		County of Riverside	
	Families	Percent	Families	Percent
0,000-14,999	1,135	11.8	52,658	10.4
15,000-29,999	2,322	24.2	104,084	20.5
30,000-44,999	1,838	19.1	94,359	18.6
45,000-59,999	1,483	15.4	77,467	15.3
60,000-74,999	951	9.9	60,829	12.0
75,000-99,999	642	6.7	32,032	6.3
100,000 and up	1,232	12.8	85,142	16.8
Total	9,602	100.0	506,571	100.0
Median Household Income	$42,425		$45,421	
Total Income (thousands)	$499,117		$311,045,510	
Average Household Income	$51,979		$61,286	
Per Capita Income	$17,036		$21,072	

Source: Husing, John, E., City of Lake Elsinore – Demographic, Economic & Quality of Live Data, Economics & Politics, Inc. September 20, 2000.

Lake Elsinore's situation may be unique in that residential demand is reaching it from two directions. Pressure is coming down the I-15 Freeway as Orange County residents move inland in search of more affordable homes. This migration added over 47,000 people to Corona during the 1990's and that migration is continuing southward towards Lake Elsinore. Simultaneously, San Diego County's limited supply of residential property has led to home prices affordable to only about 25 percent of its residents. This is encouraging families to migrate northward up the I-15 Freeway. In the 1990's, this phenomenon caused the populations of the adjoining Cities of Temecula and Murrieta to grow by over 50,000 people. In the next decade, these northward and southward trending forces will combine to further fuel housing growth in and around Lake Elsinore.

Between 1990 and 2000, the number of dwelling units in Lake Elsinore increased by 3,158 units to 10,150 units, representing a 66.7 percent increase. This increase included 2,914 new single-family units (92.3 percent), 214 new multi-tenant units (6.8 percent), and 30 new mobile homes (0.9 percent), increasing the share of single-family units from 62.5 to 71.7 percent. During that period, the City went from having the second lowest share of single-family homes to the fourth highest among mid-sized urban (25,000-50,000 population) Inland Empire cities.

Fueling the area's growth is the availability of lower cost housing within the Lake Elsinore area. In the fourth quarter of 1999, Lake Elsinore's median existing home price of $120,135 was from $67,000 to $143,000 less expensive than median home prices in Los Angeles ($280,000), San Diego ($288,000), Ventura ($338,500), or Orange ($347,000) Counties. As indicated in Table E.5-20, in 2002, the median price of a single-family home in Riverside County was $189,000. In contrast, within that portion of Lake Elsinore located in relative proximity to the project site (i.e. Zip Code 92530), the median housing price was only $170,000.

Table E.5-20: Annual Home Sale Activities

Year	Location	Zip Code	Single-Family Residences			Condominiums		
			Sales Count	Price Median ($1,000)	Price Change	Sales Count	Price Median ($1,000)	Price Change
2001	Riverside County	-	25,964	163	16.1	4,668	147	8.1
	Lake Elsinore	92530	760	145	13.3	32	76	41.1
		92532	75	210	17.0	-	-	-
2002	Riverside County	-	30,151	189	16.0	5,749	170	15.6
	Lake Elsinore	92530	840	170	17.2	30	86	13.9
		92532	141	249	18.3	-	-	-

Source: Dataquick Real Estate News

In January 1999, an estimated 12.9 percent of the City's total housing inventory was assumed to be vacant by the CDF. In January 2000, there were an estimated 3.43 persons for each occupied dwelling unit within the City.

5.2.3 Evaluation of the Impact of any Substantial In-Migration of People on the Impact Area's Governmental Facilities and Services

Migration, inclusive of both in-migration and out-migration, is often the response to a disequilibrium in the supply of or demand for certain goods and services (e.g., jobs, housing). Changes in family sociodemographic characteristics, such as education, family size and structure, health, earnings and employment, can all be related to changes in the derived demand for migration. In a static model, people would find an ideal location, move into their dream home, and then remain in the same place. In reality, people are constantly seeking out new opportunities and ways of improving their current situations. For example, the average male in the United States changes jobs about ten times during his life. In a mobile society, these job changes are often associated with changes in the place of residence. Employment opportunities can, therefore, serve as a determinant of in-migration to and out-migration from a particular geographic area.

As indicated herein, Riverside County has been and is projected to remain one of the fastest growing counties in California. Similarly, between 1990-2000 and between 2000-2001 employment growth in the Inland Empire was the strongest in the six-county SCAG region. Within the County, the construction sector accounts for 12 percent of the region's entire labor force, compared to only six percent within the State as a whole. Between 1995-2002, the United States Bureau of Labor Statistic's occupational employment statistical category that includes "construction" was projected to increase by 20,780 new jobs or nearly 2,600 new construction jobs per year independent of any contribution produced by the proposed project.

With regards to the area's housing costs, Riverside County is one of the most affordable areas, on average, both in terms of rental rates ($871/month) and median existing housing costs ($189,000). Within that portion of Lake Elsinore located in relative proximity to the project site (i.e. Zip Code 92530), the median housing price was even less than the County average at only $170,000. In addition, as of January 1999, an estimated 12.9 percent of the City's total housing inventory was assumed to be vacant.

Due to its relative affordability, the building industry will continue to eye the Inland Empire as the State's leading housing market. Due to these factors, independent of the proposed project, in-migration to Riverside County for jobs and for housing is a major reason for the County's historic and for its projected continued growth.

Based on experience derived from similar federal pumped storage projects (e.g., 600-MW River Mountain Pumped Storage Project, PN 10455), construction-term and operational employment demands for the proposed project can be reasonably determined. For planning purposes, the estimated construction term for the proposed project is assumed to take slightly more than four years. That schedule could, however, be reduced based on a greater allocation of resources. The expected schedule for on-site employment, absent that associated with the proposed transmission alignment, is presented in Table E.5-21.

Table E.5-21:Schedule of Construction Manpower Requirements by Year (Total On-Site Labor Force by Trade)

Trade	Year					Total
	1	2	3	4	5	
General Labor	145	175	160	175	135	790
Rodman	15	15	15	20	15	80
Carpenter	60	95	75	85	55	370
Teamster	30	45	45	55	15	190
Operating Engineer	70	130	95	110	55	460
Pipe Fitter	5	10	30	30	5	80
Other Mechanical	5	10	30	30	5	80
Electrical	5	10	15	15	125	170
Supervisory and Support	50	45	70	80	25	270
Total Man-Years	385	535	515	585	440	2,460

Trade	Year					Total
	1	2	3	4	5	
Percent of Total Employment	15.7	21.7	20.9	23.8	17.9	100.0

Source: The Nevada Hydro Company, Inc.

In total, the proposed hydropower project is projected to generate about 2,460 man-years of construction employment, of which roughly 55 percent will be skilled trades, 30 percent will be general labor, and 15 percent will be supervisory and support staff. Approximately 70 percent of the projected labor demand will occur in Years 2-4, with the peak effort occurring in Year 4. Peak employment at the project site will reach about 600 workers.

In contrast, only about twenty individuals will be required to manage, operate, and maintain the proposed project. The total operational staff includes two management personnel, seven operating staff (i.e., two per shift plus a chief operator), and eleven maintenance personnel.[38] When compared to the approximately 600 workers required during a single peak year to construct the proposed hydropower project, operational impacts would be minimal.

A substantial portion of the County's economy is driven by construction activities and by the construction trades. As a result, a substantial construction labor pool now exists within the general project area. In addition, a large portion of the County's historic growth is attributable to the in-migration of individuals and families who already reside within the larger SCAG region but elect to relocate to Riverside County (and the Inland Empire) based on such factors as comparable housing costs and historic growth in the area's employment opportunities. Based on Statewide averages, an estimated six percent of those new residents are already in the construction industry. In Riverside County, however, an estimated 12 percent of the County's labor force is in the construction industry. Construction unions are active throughout Riverside County and provide employment and training opportunities within each area of specialization.

During the construction period, it can, therefore, be concluded that no significant number of workers would need to in-migrate to the project area merely as a result of the proposed project. The existing area-wide work force is sufficient to accommodate project-related needs. A limited number of specialty construction contractors (e.g., earth boring machine operators and support personnel) may, however, relocate to the general project area from elsewhere within either the general SCAG region or from outside the socio-economic impact areas.

Once operational, overall project-related employment demands will diminish substantially. Of the majority of the twenty individuals required to operate and maintain the project, the associated experience and skill level required for the project's ongoing operations is readily available for the area's existing and projected labor force. In the absence of other comparable pumped storage projects within the southern California area, it is likely that the two management personnel and the chief operator may be recruited from out-of-the-region.

The precise number of individuals in-migrating to the project area cannot be reasonably predicted but would be expected to be so small, particularly in the context of existing domestic and international in-migration into the County, as not be to produce a significant localized impact. In the absence of any significant project-induced in-migration, no measurable impacts on local government facilities and/or services are anticipated to result from the proposed project.

[38]/ Additional contract and independent labor may be associated with the project's ongoing operations. For example, qualified monitors will be employed to routine determine water quality conditions below the upper reservoir and groundkeepers, arboristics, and horticulturalist will be required to maintain the landscaping associated with the project. Locally available independent firms, consultants, and contractors will be employed to perform these and other related functions.

5.2.4 On-Site Manpower Requirements and Payroll during and after Project Construction

On-site, construction-term manpower requirements associated with the proposed project, by year, are summarized in Table E.5-21. As indicated therein, the proposed project is projected to generate about 2,460 man-years of construction employment. In order to calculate estimate payroll for those workers, wage information from the Riverside County Economic Development Agency and from California Employment Development Department was reviewed. Estimates rates for each of the identified trades is presented in Table E.5-22. The wages presented therein are not intended to represent prevailing wages. When union wage scales are provided, those rates are used in lieu of non-union scale.

Table E.5-22:General Wage Assumptions

Trade	Hourly Wage ($)[1]		
	Low	Medium	High
Construction Phase			
General Labor	8.00	10.00	14.00
Rodman[2]	6.25	12.00	17.50
Carpenter	15.00	20.00	25.00
Teamster[3]	12.00	20.50	33.56
Operating Engineer[4]	24.00	28.50	32.00
Pipe Fitter	13.00	19.44	22.00
Other Mechanical[5]	17.00	28.25	44.16
Electrical[4]	19.94	23.00	31.00
Supervisory and Support[6]	15.00	26.37	35.96
Operational Phase			
Facility Manager[5]	17.00	28.25	44.16
Chief Operator[7]	11.51	20.81	36.82
Operating Engineer	24.00	28.50	32.00
Maintenance[48]	13.27	20.62	34.63

Notes:

1. Except where noted, wages are for Riverside County for individuals with three-years experience with the firm.
2. No information for this trade provided. Wage information is based on “first line supervisors and managers – helpers, labors” for Tulare County.
3. Based on wage survey information for “grader, dozer, and scraper operators” from Monterey Bay counties (i.e., Monterey, San Benito, Santa Cruz).
4. Union rates.
5. Based on wage survey information for “mechanical engineers” from Los Angeles County.
6. Based on wage survey information from San Bernardino County for “construction managers.”
7. Based on wage survey information from Los Angeles County for “communications, transportations, utilities operations manager.”
8. Based on wage survey information from Los Angeles County for “maintenance repairers – general utility.”

Source: California Employment Development Department, 2003 Directory of California Local Area Wages; Riverside County Economic Development Agency, 2002 Occupational Outlook, Labor Market Information Study, 2002

Recognizing that wages will likely increase over time, for planning purposes, wage rates remain constant and the "high" wage rates have been utilized to derive payroll estimates. Those rates are they assigned to the corresponding trade and estimated number of workers, as presented in Table E.5-21, in order to derive payroll costs for each trade group. All construction workers are assumed to work a 40-hour week and a 50-week year[39]; no over-time rates are included. In addition, payroll costs for off-site workers have been considered.

As indicated in Table E.5-23, over projected construction period, total estimated payroll costs are projected to be on the order of $126,139,800 (in 2002 dollars) for the proposed hydropower project.[40] Based on the same general assumptions as used to derive estimated construction-term payroll (i.e., 40-hour week and 50-week year), once operational, annual payroll requirements are estimated to be $1,051,820 (in 2002 dollars).

Table E.5-23:Construction Payroll Estimates By Trade By Year

Trade	Average Hourly Wage	Estimated Payroll by Year ($000)					Total ($000)
		1	2	3	4	5	
General Labor	$14.00	4,060	4,900	4,480	4,900	3,780	22,120
Rodman	$17.50	525	525	525	700	525	2,800
Carpenter	$25.00	3,000	4,750	3,750	4,250	2,750	18,500
Teamster	$33.56	2,013.6	3,020.4	3,020.4	3,691.6	1,007.8	12,753.8
Operating Engineer	$32.00	4,480	8,320	6,080	7,040	3,520	29,440
Pipe Fitter	$22.00	220	440	1,320	1,320	220	3,520
Other Mechanical	$44.16	441.6	883.2	2,649.6	2,649.6	441.6	7,065.6
Electrical	$31.00	310	620	930	930	7,750	10,540
Supervisory and Support	$35.96	3,596	3,236.4	5,034.4	5,735.6	1,798	19,400.4
Total ($000)	-	18,646.2	26,695	27,789.4	31,217	21,692.4	126,139.8

Source: The Nevada Hydro Company, Inc.

5.2.5 Numbers of Project Construction Personnel who Currently Reside within the Impact Area, Commute Daily to the Construction Site from Places Situated Outside the Impact Area, and Relocate on a Temporary Basis within the Impact Area

As indicated in Table E.5-8, an estimated 12 percent of the County's workforce was involved in the construction industry. If that percentage is assumed to be constant for both the County and for the City of Lake Elsinore and for both employed and unemployed workers, based on the labor force information presented in Table E.5- 18, an estimated 97,992 individuals in the County and 1,498 individuals in the City

39/ These assumptions are used for planning purposes only and are not intended to limit, restrict, or otherwise modify the number of hours worked, the benefits to be provided to or derived by, or the wages received by project-related personnel. The wages cited herein are again provided for planning purposes only are not intended to represent prevailing wages or current union wage scales.

40/ Construction-term payroll estimates for the project's associated transmission facilities are not, however, included in that estimate since those payroll estimates could vary substantially based on the precise alignment(s) selected.

are in the construction industry. Of those, 5,964 construction workers in the County, including 102 construction workers in the City, are currently (June 2003) unemployed.

During the peak project year, only 600 on-site construction workers would be required for the proposed hydropower project. That project-related labor requirement represents only about ten percent of the total number of construction workers currently unemployed within the general project area. As a result, with limited exception, it can be assumed that the project's construction personnel now resides within reasonable commuting distance to the project site and, therefore, would not need to relocate to fill project-related employment opportunities.

The limited exception may relate to certain specialty contractors (e.g., earth boring equipment operators). Although the United States Department of Labor indicates that there were 24,000 horizontal and earth boring machine operators in the United States in 2000 and that the demand for that area of specialization will increase "about as fast as average" between 2000 and 2010,[41] both the equipment and the operator may need to be brought in by the project's general contractor.

This conclusion (i.e., *de minimus* socio-economic impacts associated with potential in-migration of project-related workers) is supported by recent studies conducted by the County of Riverside for comparably sized projects. For example, the Riverside County Transportation Commission, in conjunction with the Federal Highway Administration, California Department of Transportation, and County of Riverside, is currently processing two "Tier I Draft Environmental Impact Statements/Reports" for separate regional transportation improvement projects (i.e., Hemet to Corona/Lake Elsinore Corridor and Winchester to Temecula Corridor). Both projects are major new automotive transportation corridors, extending up to 1,000-feet wide (bandwidth) and extending an unspecified number of miles (estimated to be over twenty miles) through western Riverside County. Neither environmental analysis identifies any in-migration of workers for the construction of those major transportation improvement projects.

5.2.6 Determination of whether the Existing Supply of Available Housing within the Impact Area is Sufficient to Meet the Needs of the Additional Population

As indicated by the LAEDC, in 2002, an estimated 66,970 housing unit permits were issued in the Los Angeles five-county area. The Riverside-San Bernardino area accounted for 50 percent of all the permits issued and captured 64 percent of all single-family construction activity. The LAEDC found that new monthly housing costs in the Inland Empire ($883) were substantially below those of Orange County ($2,081), Ventura ($1,858), and Los Angeles ($1,445) Counties.

With regards to apartment rents, San Bernardino County ($880/month) and Riverside County ($871/month) are the most affordable areas with the five-county, on average.

As of January 2001, the County's housing stock totalled 595,682 units. With a vacancy rate of about 13.4 percent, a total of 79,820 dwelling units were available for occupancy at the beginning of 2001. As of 2000, the number of dwelling units in Lake Elsinore totalled 10,150 units. With an occupancy rate of 12.9 percent, a total of 1,310 dwelling units were available for occupancy within the City.

Based on the anticipated limited likelihood of project-induced in-migration, it is clearly evident that the area's existing housing inventory is sufficient to accommodate any potential in-migration that would occur as a result of the proposed project.

[41]/ United States Department of Labor, Outlook Handbook and the Career Guide to Industries, Bulletin 2540, 2002-03 Edition, Bureau of Labor Statistics, 2002.

5.2.7 Numbers and Types of Residences and Business Establishments that would be Displaced by the Proposed Project, Procedures to be Utilized to Acquire these Properties, and Types and Amounts of Relocation Assistance Payments that would be Paid to the Affected Property Owners and Businesses

5.2.7.1 Numbers and Types of Residences and Businesses Displaced

The potential for project-induced residential and business displacement are separately addressed below. Anticipated impacts are, however, subject to change based on the precise project options and locations selected and independent property and business owner decisions.

Residential Displacement. Presented in Figure E. 5-1 (Parcels along Primary Transmission Right-of-Way) is a detailed assessment of all parcels of real property located along the proposed northern and southern transmission alignment. Most of those properties are vacant and uninhabited and, as such, the proposed construction and operation of the proposed transmission alignment will not result in any substantial residential displacement. .

Since the above listing is inclusive of both the proposed northern transmission alignment and southern transmission alignment, and variations thereof, the list of properties should not be seen as indicative of the actual number of properties potentially affected by the proposed project. Similarly, by including this information, it is the Applicant's intent to ensure full disclose and not to suggest that each of the addressed represented constitute residential properties whose owners or occupants will be displaced by the proposed project.

For planning purposes, the Applicant has identified a construction laydown area larger than deemed required for the Santa Rosa powerhouse sites. As a post-project use for the proposed construction marshalling yard, the Applicant now proposed to construe and convey to a local park entity a neighborhood park, inclusive of a variety of recreational facilities. In order to facilitate the design of that proposed park site and physical enhance the relationship between the park and the school, the Applicant has included within the construction laydown area the 12-unit Santa Rosa Mountain Villas (33071-33091 Santa Rosa Drive, Lake Elsinore). The Applicant will acquire that property and demolish the existing residential units.

Business Displacement. No businesses are expected to be displaced from the Proposed Project.

APN (8 Digit)	Owner's Name	Owners Address	City/ZIP	Acreage
10205106	USA (Camp Pendleton)	Public Agency		1739.66
10113017	Gonzales Roland F Revocable Tr	153 S Cypress St	Orange CA 92866	21.67
10113009	Jensen Roland J Tr & Jensen Helen	1010 E Chestnut Ave	Santa Ana CA 92701	260.35
10153016	USA (CNF)	Public Agency		653.00
10113004	Long Richard W & Margaret J	617 Narcissus Ave	Corona Del Mar CA 92625	80.00
10106013	Guthrie Richard & Georgiana R	43077 Tenaja Rd	Murrieta CA 92562	40.00
10117001	Spain Frank K (DBA)	P O Box 3660	Ft Pierce Fl 34948	320.00

APN (8 Digit)	Owner's Name	Owners Address	City/ZIP	Acreage
10152001	USA (Camp Pendleton)	Public Agency		49000.00
10106011	**United States of America**	Public Agency		415.05
10111009	Plummer Cowan A & Martha B Family	1421 Hollencrest Dr	West Covina CA 91791	80.00
10153015	USA (CNF)	Public Agency		632.00
10117003	Spain Frank K (DBA)	P O Box 3660	Ft Pierce Fl 34948	527.21
10111017	**Wills Chris A**	725 W La Veta Ave #260	Orange CA 92868	4.61
10117002	Spain Frank K (DBA)	P O Box 3660	Ft Pierce Fl 34948	359.00
10106012	Caraher Paul T Jr & Donna J Trs	2061 Omega Dr	Santa Ana CA 92705	35.85
10115003	Anvarinejad Ahmad	44 Mancera	Rancho Santa Margarita CA 92688	10.00
10115001	Gonzales Roland F 02-03-86	153 S Cypress St	Orange CA 92866	70.00
10115008	USA (CNR)	Public Agency		585.43
10113012	Gonzales Roland F Revocable Tru	153 S Cypress St	Orange CA 92866	4.55
10111025	USA (CNR)	Public Agency		380.68
10113008	USA (CNR)l	Public Agency		563.88
10113001	Plummer Cowan A & Martha B Family	1421 Hollencrest Dr	**West Covina CA 91791**	40.00
10115010	W R A (Survivors) Trust	C/O William C Arterberry	40147 Calle Roxanne 92028	159.88

Source: Elsinore Valley Municipal Water District

Table E.5-24:Real Properties Located Along the Project's Rights-of-Way (Riverside County)

APN	Owner's Name	Owner's Address	City/Zip	Acreage
391280009	USA 391	Unknown 01-27-94		20
391280010	USA 391	Unknown 01-27-94		20
391280008	Riverside Co Habitat Conservation Agency	600 E Tahquitz Way	Palm Springs CA 92262	20.02
391290004	Riverside Co Habitat Conservation Agency	600 E Tahquitz Way	Palm Springs CA 92262	20.11
391290003	Cordes, Joseph	P O Box 1236	Corona CA 92878	20.14
391290002	Riverside Co Habitat Conservation Agency	600 E Tahquitz Way	Palm Springs CA 92262	20.01
391040005	Riverside County Habitat Conserv Agency	600 E Tahquitz Canyon Way	Palm Springs CA 92262	162.86
391290015	Riverside Co Habitat Conservation Agency	600 E Tahquitz Way	Palm Springs CA 92262	20.01

APN	Owner's Name	Owner's Address	City/Zip	Acreage
391290001	State of California	1416 9th Street	Sacramento CA 95818	20.03
391050012	USA BLM	6221 Box Springs Blvd	Riverside CA 92507	20.25
290140026	Starfield Sycamore Inv	14 Corporate Plaza	Newport Beach CA 92660	10.02
290140023	Starfield Sycamore Inv	14 Corporate Plaza	Newport Beach CA 92660	91.86
290150005	USA 290	Unknown		160
391040005	Riverside County Habitat Conserv Agency	600 E Tahquitz Canyon Way	Palm Springs CA 92262	162.86
391050007	12510 Temescal	497 S Country Hill Rd	Anaheim CA 92807	156.76
391050012	USA BLM	6221 Box Springs Blvd	Riverside CA 92507	20.25
391050011	USA BLM	6221 Box Springs Blvd	Riverside CA 92507	20.01
391070016	Indian Truck Trail Dev Co	37859 Oxford	Murrieta CA 92562	10.67
391070018	Indian Truck Trail Dev Co	37859 Oxford	Murrieta CA 92562	3.68
391070001	Mccoy Const Co	23622 Calabasas Road Ste 149	Calabasas CA 91302	2.24
290140026	Starfield Sycamore Inv	14 Corporate Plaza	Newport Beach CA 92660	10.02
290150005	USA 290	Unknown		160
290150007	USA 290	Unknown		240
290150006	Grace Korean Church At Norwalk	1645 W Valencia Dr	Fullerton CA 92833	80
391200016	Paragon Building Products Inc	2895 Hamner Ave	Norco CA 92860	18.73
390120011	EVMWD	3740 University Ave	Riverside CA 92502	5.8
391200010	Murdock, David H.	10900 Wilshire Blvd 6th Fl	Los Angeles CA 90024	2.09
391200002	State Of Calif	P O Box 231	San Bernardino CA 92403	4.11
391200007	Murdock, David H.	10900 Wilshire Blvd 16th Fl	Los Angeles CA 90024	21.38
391200012	Pacific Clay Products Inc	10900 Wilshire Blvd No 1600	Los Angeles CA 90024	3.19
290170005	USA 290	Unknown		640
391230003	Murdock, David H.	10900 Wilshire Blvd 16th Floor	Los Angeles CA 90024	13.83
391230004	Murdock, David H.	10900 Wilshire Blvd 16th Floor	Los Angeles CA 90024	26.17
391230005	Gateway Business Park	10900 Wilshire Blvd Ste 1600	Los Angeles CA 90024	80

APN	Owner's Name	Owner's Address	City/Zip	Acreage
391240001	Pacific Clay Products Inc	10900 Wilshire Blvd No 1600	Los Angeles CA 90024	324.19
290170006	USA 290	Unknown		656.63
391260014	Chen, Jennifer	606 N First St	San Jose CA 95112	125.07
391260001	Pacific Clay Products	10900 Wilshire Blvd No 1600	Los Angeles CA 90024	122.28
391260021	Bayless, Joseph	P O Box 568	Wildomar CA 92595	25
391260022	Bayless, Joseph	P O Box 568	Wildomar CA 92595	18.47
391260023	Bayless, Joseph	P O Box 568	Wildomar CA 92595	18.45
391260012	Koretoff, Daniel	507 De La Fuente	Monterey Park CA 91754	40
391260016	Deetz,Clayton	1514 S D Street	San Bernardino CA 92408	40
391260013	Smith, Jan	Box 597	Helena Mt 59601	40
290170007	USA 290	Unknown		282.83
391270013	USA 391	Unknown		640
391260051	La Laguna Estates	93 Lakeshore	Irvine CA 92604	242.39
391260044	City Of Lake Elsinore	130 S Main Street	Lake Elsinore CA 92530	2.24
391270008	USA 391	Unknown 11-29-95		37.24
387290001	Good Land Inv Iii	2142 Liane Lane	Santa Ana CA 92705	60.78
387290002	Good Land Inv Iii	2142 Liane Lane	Santa Ana CA 92705	62.56
387020019	Good Land Inv Iii	2142 Liane Lane	Santa Ana CA 92705	274.83
387020013	USA 387	Unknown		74.05
387020015	USA 387	Unknown		115.16
387290006	Good Land Inv Iii	2142 Liane Lane	Santa Ana CA 92705	28.62
387020002	USA 387	US Dept of Interior	Washington DC 21401	4.28
387290008	Good Land Inv Iii	2142 Liane Lane	Santa Ana CA 92705	23.74
387020018	USA 387	Unknown		184.3
387260001	Hasty, Larry	14130 N Main Divide Road	Lake Elsinore CA 92530	20.04
387260004	Wallis	33202 Paseo Blanco	San Juan Capo CA 92675	21.65
387260005	Pritchett, Robert	32333 Ortega Highway	Lake Elsinore CA 92530	20.52
387260007	Baba, Thomas	12 Sudbury Place	Laguna Niguel CA 92677	20.05
387260006	Thorell, Edwin	P O Box 611	Lake Elsinore CA 92531	23.42

APN	Owner's Name	Owner's Address	City/Zip	Acreage
386090010	USA 386	Unknown		121.77
386060052	Amen, Jeff	32507 Ortega Hwy	Lake Elsinore CA 92530	0.06
386090011	USA 386	Unknown		139.08
386090012	USA 386	Unknown		360.86
386110015	Usa 386	Unknown		117.63
385030007	Connell, Tracy	1231 Hygeia Ave	Leucadia CA 92024	80
385120010	Usa 385	Unknown 04-18-79		519.07
				0
385120009	USA 385	Unknown 04-18-79		103.03
385120019	USA 385	Unknown 08-07-97		431.61
385120018	USA 385	Unknown 08-07-97		79.06
385120012	USA 385	Unknown 04-18-79		118.65
383020005	EVMWD	P O Box 3000	Lake Elsinore CA 92530	30
385150015	USA 385	Unknown 04-18-79		0
385150012	USA 385	Unknown 04-18-79		476.8
385150014	USA 385	Unknown 04-18-79		251.95
382090005	USA 382	Unknown		641.07
382090003	USA 382	Known		600.84
901110001	USA 901	Unknown		638.66
901110004	USA 901	Unknown		511.02
901170032	Accurate Air International Inc Dbpp	7550 Eads Ave Unit 402	La Jolla CA 92037	74.23
901170037	Hetzner Family Ltd Partnership	20121 Amapola	Orange CA 92669	60.93
901170038	Koskovich, Harvey	38305 Maisel	Murrieta CA 92562	24.58
929020011	Meek, Scott	40551 Corte De Rubi	Murrieta CA 92562	6.59
901170025	USA 901	Us Dept Of The Interior	Washington DC 21401	16.76
929020012	Mathis, Robert	Schneifel Forsthaus No 2	D 54597 Olzheim Germany	5.5
929020013	Short, Delphine	890 Beaumont Ave	Beaumont CA 92223	5.5
929020014	Short, Delphine	890 Beaumont Ave	Beaumont CA 92223	5.5
932300009	Vietnamese American Buddhist Assn	12292 Magnolia Street	Garden Grove CA 92541	19.8
901130005	USA 901	US Dept of Interior	Washington DC 21401	640
901130006	USA 901	US Dept of Interior	Washington DC 21401	544

APN	Owner's Name	Owner's Address	City/Zip	Acreage
932300016	Allen, Gary	1070 Serene Dr	Corona CA 92880	26.05
932300004	Reynolds, David	22830 Hidden Creek Ct	Murrieta CA 92562	19.97
901130008	USA 901	US Dept of Interior	Washington DC 21401	624
901120001	USA 901	US Dept of Interior	Washington DC 21401	323.38
901130019				0
901120007	USA 901	Unknown 04-05-84		31.8
901120008	USA 901	Unknown 10-28-83		45

Source: Elsinore Valley Municipal Water District

5.2.7.2 Procedures to be Utilized to Acquire these Properties

The majority of the project site exists on public lands, primarily those under the jurisdiction of the Forest Service located within the CNF. Under Forest Service procedures, the Applicant would require a SUP providing a 50-year leasehold interest on those public lands required for the project's construction, operations, and maintenance. Established Forest Service procedures will be utilized in the issuance of Federal authorization of those real property interests. Similarly, portions of the project site are located on lands owned and under the jurisdiction of the BLM, Caltrans, the City of Lake Elsinore, and the EVMWD. Each of those entities is a public agency and maintain specific procedures for the conveyance of real property interests.

With regards to the limited number of affected privately owned properties, the Applicant will seek to acquire fee simple or leasehold interests on those lands through voluntary sale or conveyance.

5.2.7.3 Types and Amounts of Relocation Assistance

Persons and businesses displaced as a result of public action may be authorized to receive relocation benefits as a result of those actions. Where applicable, the Applicant will comply with the requirements governing property acquisition, displacement, and relocation as described in Section 7260-7266 of the California Government Code (CGC) and, as applicable, Section 33410-33418 of the California Health and Safety Code (H&SC).

5.2.8 Fiscal Impact Analysis Evaluating the Incremental Local Government Expenditures in Relation to the Incremental Local Government Revenues that would Result from the Construction of the Proposed Project[42]

As indicated in the CEC's "Environmental Performance Report of California's Electric Generation Facilities," commonly identified benefits of electric generating facilities include the following: (1) A reliable and affordable electricity supply supports economic development and helps maintain the State's high standard of living; (2) Electric generating facilities supply electricity for a variety of uses, including lighting, heating, ventilation, and air conditioning, and power for industrial and agricultural motors and is essential for transportation, communication, public safety, and public health, as well as public comfort and

[42]/ Potential project-related fiscal impacts on educational facilities, police and fire protection services, recreational facilities, solid waste collection and disposal, potable and reclaimed water systems, and wastewater collection and treatment systems are not specifically addressed herein but will be examined as part of the project's subsequent environmental review.

convenience; (3) In-State electric generation enhances Statewide electricity supplies and system reliability, and reduces the need for importing electricity over congested transmission lines; (4) Power plant construction projects create approximately ten times more jobs than power plant operations; and (5) The CEC has identified no significant disproportionate environmental justice impacts in any of the power plant projects it has approved since 1998.[43]

As further indicated by the CEC: "The biggest socioeconomic benefit of electric generation facilities comes from the electricity they provide. California has the largest economy of any state in the county and one of the largest economics in the world. Because electricity powers the economy and helps maintain the state's high standard of living, the availability of a reliable and affordable electricity supply is essential to the well being of the state and its citizens."[44]

The following fiscal impact analysis (FIA) estimates the potential economic impacts of the proposed project on the costs and revenues of those governmental units serving the project area. The focus of this analysis is on project-related fiscal upon on local governmental entities and does not address economic impacts on the federal government (e.g., Forest Service).

Although a substantial portion of the proposed project, located on non-public lands, is located within unincorporated areas of Riverside County, those areas are located within the adopted SOI of the City of Lake Elsinore. As such, this FIA focuses on possible economic impacts to that entity. In addition, because short-term (construction) impacts may differ from long-term (operational) impacts, both are separately examined below.

Construction Impacts. As indicated in Table E.5-21, the proposed project will generate about 2,460 man-years of construction employment, of which roughly 55 percent will be skilled trades, 30 percent will be general labor and the balance will be clerical and supervisory staff. Approximately 66.4 percent of the person-years are incurred in Years 2, 3, and 4 of the construction period, with the peak effort occurring in Year 4, when about 585 person-years of construction will be required. Peak employment at the site will reach nearly 600 employees.

Based on information provided by the CEDD, it is likely that there will be a more than adequate labor force available to accommodate project-related demands. According to CEDD information, the County's labor force "will respond to the continued demand for residential, office, and heavy construction projects by adding 13,400 new jobs to payrolls by the year 2006. The majority of new jobs in construction will be in the special trade category (9,100 jobs), which includes plumbing, painting, electrical work, carpentry, and an array of other construction specialties."[45]

Due to a net in-migration trend in the area and the continuous supply of high school graduates entering the labor force, the region can be expected to supply the majority of labor force required for the project' construction. It is unlikely that significant numbers of construction personnel would commute to the project site from areas outside of the regional impact area. Project-induced in-migration is, therefore, not expected to place a significant burden on the region's existing infrastructure.

The EVMWD is a municipal water district that serves various communities in the general project area, including many of the proposed facility sites. In the vicinity of the proposed project, the EVMWD's facilities include water mains and water storage tanks. The project will utilize these facilities as a potable water source. In relation to the total service demands now being accommodated by the EVMWD, the

[43]/ Op. Cit., Environmental Performance Report of California's Electric Generation Facilities, P700-01-001, p. 42.

[44]/ Op. Cit., Staff Report: 2003 Environmental Performance Report, p. 121.

[45]/ California Employment Development Department, Riverside County Industry Trends and Outlook, 1999-2006.

potable water needs of the proposed project are relatively minor and will not require any additional upgrades to the EVMWD's overall regional water supply.

During construction, temporary comfort facilities (e.g., port-a-potties) will be brought onto the project site by the Applicant for use by construction personnel. These facilities are typically leased from and serviced by private sanitation firms operating under contract to individual construction contractors. Wastes from these facilities are collected by vacuum trucks and disposed of off the project site in according with the permit requirements of each provider. No impacts upon any areawide water or wastewater providers are anticipated during the construction period and no impacts on surface or groundwater quality will result therefrom.

The project will result in an increase in traffic on certain roads in the general project area, as workers, equipment, and materials move to and from the construction site. Most workers coming to and departing the construction staging areas will utilize SR-74 and the I-15 Freeway. Similarly, truck traffic to and from the site will use these same routes. Project construction will likely include the construction and operation of an on-site concrete batch plant near the proposed powerhouse and has been designed to optimize the use of excavated material as dam base, thus reducing construction traffic.

According to Caltrans, the current annual average daily traffic on the I-15 Freeway at Main Street is 79,000 vehicles, with 8,300 ADT occurring during the peak-hour. On Ortega Highway, at Grand Avenue, current daily traffic is 8,400 vehicles, with 1,200 vehicles occurring during the peak hour.[46]

Although the underground construction work will be conducted on a three-shift basis, much of the aboveground work will be conducted on a one-shift basis. Roughly half of the workers (i.e., 300 workers in Year 4) will be working the day shift with the remainder split between the two remaining work periods.

Operational Impacts. Once operational, only about twenty individuals will be needed to manage, operate, and maintain the proposed project. Impacts attributable to those employees on local services and systems should be minimal. Construction traffic may, however, be replaced by an unknown number of visitors who will, in accordance with specific stipulations, will be able to tour the proposed hydropower facility. Depending upon the number of visitors and how access to the site is authorized for visitor use, some additional demands could be imposed on local infrastructure, including water supply and waste disposal. These impacts, however, are anticipated to be minimal and can be readily accommodated by existing service systems.

The project will contribute substantially to the revenues of local government directly through the payment of permit fees and increased real and personal property tax and indirectly through increased State taxes and local sales tax revenues, which are partially allocated to the various county and municipal governments. As indicated in Table E.5-23, over the approximately six-year construction period, total estimated construction payroll costs is estimated at $126,139,800 (in 2002 dollars). Once operational, annual payroll requirements are estimated to be $1,051,820 (in 2002 dollars).

The State corporate income tax is calculated at 8.84 percent of net income. Based on an estimated construction cost of approximately $500 million and an assumed net income of 10 percent (profit over costs), State corporate income tax for the construction phase of the project would total approximately $4,420,000.

Direct contributions to labor income and employment are only part of the total economic impact associated with the proposed project's construction. The proposed project is anticipated to produce "secondary impacts" which, themselves, will generate additional labor income and employment tangential to the project. Indirect impacts relate to the project's purchase of goods and services,

[46]/ California Department of Transportation, Traffic and Vehicle Systems Unit.

generating off-site labor income, employment, profits, and governmental revenues. Induced impacts are generated when additional labor income is spend on personal requirements.

Input-output models provide multiplier effects for several measures of construction activity, including gross output, labor income, and employment. Gross output multipliers range from 2.1 to 2.5 times direct output. That is, for every $1.00 spent on construction activities, the value of total regional activity, including direct construction, increases by $2.10 to $2.50. Labor income multipliers range from 1.8 to 2.2 times direct labor income, while employment multipliers range from 2.1 to 2.6 times direct jobs. Table E.5-25 summarizes the total impact of expenditures on construction in terms of total value of output, labor income, and employment.

Table E.5-25:Indirect and Induced Impacts of Construction Expenditures

	Output ($ million)	Labor Income ($ million)	Employment (man-years)
Direct Activity	500[1]	126.14[2]	2,460[3]
Multiplier	2.1 –2.5	1.8-2.2	2.1-2.6
Total Activity	1,050-1,250	227.05-277.51	5,166-6,396
Indirect and Induced Activity (total minus direct)	550-750	100.91-151.37	2,706-3,936

Notes:
1. Estimated project cost.
2. From Table E.5-23: Construction Payroll Estimates By Trade By Year.
3. From Table E.5-21: Schedule of Construction Manpower Requirements by Year (Total On-Site Labor Force by Trade).

Source: The Nevada Hydro Company, Inc.

As indicated therein, project-related expenditures, including indirect and induced impacts, will generate a total output of $1.05 to $1.25 billion, of which $227.05 to 277.51 million will be labor income and will generate between 5,166 to 6,396 man-years of employment. This increase in output value and labor income will flow largely to proprietors and workers. A part will accrue to governments in the form of personal and corporate income taxes, sales taxes on household and other purchases, and real property tax. The share of these impact captured within the socio-economic impact region is likely to be substantial.

In addition, by providing the EVMWD with revenues to stabilize water levels in Lake Elsinore and by improving the lake's water quality through the injection of oxygen into returning waters, the project has the potential to improve both recreational and sports fishing opportunities in Lake Elsinore. The USFWS notes:

Fishing continues to be a favorite pastime in the United States. The [United States Fish and Wildlife] Service's 2001 preliminary National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reported that 34 million anglers (16% of the U.S. population) 16 years old and older, spent more than $35 billion annually on trips, equipment, licenses, and other items to support their fishing activities. The average annual expenditure was $1,046 per angler.[47]

As indicated in the Federal Register: "The [United States Fish and Wildlife] Service recognize that fishery resources and aquatic ecosystems are integral components of our heritage and play an important role in

47/ United States Fish and Wildlife Service, Conserving American's Fisheries, Fisheries Program Vision for the Future, December 2002, p. 17.

the Nation's social, cultural, and economic well-being. Annually, approximately 50 million anglers spend $24 billion directly on tackle, equipment, food and lodging, and other recreational fishing-related expenses. The total economic output (wholesale, retail, manufacturing, and supply of goods and services) stimulated by recreational angler spending exceeded $69 billion in 1991. Those expenditures generated over $2.1 billion in Federal tax revenues, and provided employment for approximately 1.3 million people nation-wide."[48]

Citing the American Sportsfishing Association: "It is noted that, on average, an angler spends over $1,200 every year on the sport. Hidden, but none-the-less real, is a multiplying factor that effectively triples what you spend as the initial expenditure ripples through the economy."[49] In 1996, sports fishing created nearly 1.2 million jobs nationwide. Studies show that annual spending by America's 35.2 million adult anglers (16 years old and older) amounts to nearly $37.8 billion. The economic impact of these expenditures totaled nearly $108.5 billion and rippled throughout the economy with effects felt at the local, regional and national levels.[50] Based on these rates, sportfishing has a multiplier effect of 2.87, that is, for every $1.00 spent by anglers, the value of total regional activity increases by $2.87.

Drawing on studies conducted for Lake Havasu, improved recreational fishing opportunities between 1989 and 2001 resulted in an approximately 212 percent increase in angler use days.[51] If fishermen are not increasingly satisfied, numbers of anglers will not increase and if the quality of the catch is not better, angler interest will wane.[52] Although the economic analysis for Lake Havasu may not be directly applicable (e.g., for every 10% increase in non-resident angler visitation, some 65 jobs could be created, $3.4 million of output generated and $1.1 million of employment income added), the report concluded, from a local economic perspective "[a]ngler tourism pays off."[53]

48/ United States Government Printing Office, Federal Register, Volume 61, Number 107, June 3, 1996.

49/ American Sportsfishing Association, Sportsfishing in America – Values of our Traditional Pastime, 2002, p. 5.

50/ Maharaj, Vishwanie and Carpenter, Janet E., The 1996 Economic Impact of Sport Fishing in the United States, American Sportsfishing Association, 1997.

51/ Anderson, Bernard E., The Socio-Economic Impacts of the Lake Havasu Fisheries Improvement Program, October 30, 2001, p. 5.

52/ Ibid., p. 7.

53/ *Ibid*., p. 32.

BLUEWATER
RENEWABLE ENERGY STORAGE

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E
ENVIRONMENTAL REPORT
SECTION 6 – REPORT ON GEOLOGICAL AND SOIL RESOURCES

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

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Federal Energy Regulatory Commission
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EXHIBIT E – SECTION 6 REPORT ON GEOLOGICAL AND SOIL RESOURCES

As required under 18 CFR 4.41(f)(6), the Applicant is to provide a report on the geological and soil resources in the proposed project area and other lands that would be directly or indirectly affected by the proposed action and the impacts of the proposed project on those resources. The information required may be supplemented with maps showing the location and description of conditions. The report must contain:

1. A detailed description of geological features, including bedrock lithology, stratigraphy, structural features, glacial features, unconsolidated deposits, and mineral resources;
2. A detailed description of the soils, including the types, occurrence, physical and chemical characteristics, erodability and potential for mass soil movement;
3. A description showing the location of existing and potential geological and soil hazards and problems, including earthquakes, faults, seepage, subsidence, solution cavities, active and abandoned mines, erosion, and mass soil movement, and an identification of any large landslides or potentially unstable soil masses which could be aggravated by reservoir fluctuation;
4. A description of the anticipated erosion, mass soil movement and other impacts on the geological and soil resources due to construction and operation of the proposed project; and
5. A description of any proposed measures or facilities for the mitigation of impacts on soils.

6.0 REPORT ON GEOLOGICAL AND SOIL RESOURCES

6.1. Geology and Soils Environmental Setting.

Lake Elsinore is a shallow lake (13 meters maximum depth based on historic records) with a relatively small drainage basin (<1,240 square kilometers) from which the San Jacinto River flows (semi-annually) into and terminates within the lake's basin. Lake Elsinore has overflowed to the northwest through Walker Canyon very rarely, only three times in the 20th Century and 20 times since 1769 based on Mission diaries. Each overflow event was very short-lived (<several weeks), demonstrating that Lake Elsinore is essentially a closed-basin lake system. Conversely, Lake Elsinore has dried completely on four occasions since 1769.[1]

Lake Elsinore sits within a structural depression (a down-dropped graben) along the Elsinore fault. Lake Elsinore is surrounded by a combination of predominantly igneous and metamorphic rocks. Lake Elsinore is constrained along its southern edge by the steep, deeply incised Elsinore Mountains. The Elsinore Mountains provide a local sediment source. Total sediment thickness underlying Lake Elsinore is estimated to be between 600 and 1,000 meters (m). Two exploratory wells have been drilled at the east end of the lake to 542 m and 549 m, respectively, with sediment described as mostly fine-grained.

Presented in Figure E.6-1 is a map showing the Project's general location relative to physiographic provinces of southern California. Colored areas define structural assemblages. The approximate location of most faults having large displacement or length are shown. The Peninsular Ranges Province is sharply bounded to the east by the San Andreas fault zone but its northern extent is poorly defined. The inferred boundary between the Peninsular Ranges and the San Gabriel Mountains assemblage is hidden under thick Quaternary deposits and its location and character are highly speculative.[2]

6.1.1 City of Lake Elsinore.

As indicated therein and as illustrated in Figure E.6-2 "West of the Elsinore Valley, the Santa Ana Mountains uplift is dominated by primarily granitoid rocks of Cretaceous age belonging to the Peninsular Ranges batholith. Immediately above Lake Elsinore, rocks are primarily potassium feldspar – bearing tonalite and granodioorite. Bodies of biotite and hornblende granodiorite are present to the northwest and southwest; farther to the west, hornblende gabbro occurs locally. Roof pendants consisting of metasedimentary rocks of Mesozoic age are also present to the west. To the west and north, siliceous metasediments of Jurassic Bedford Canyon Formation are exposed in a broad east-west trending belt. Where drainages debouch on the valley floor, alluvial fan deposits comprising gravel, sand, silt and ranging in age from mid-Pleistocene to Holocene and are conspicuous. Unconsolidated Holocene deposits of bouldery to sandy alluvium are present in active and recently active drainage channels. The Elsinore Valley itself is floored primarily by unconsolidated sand, silt, and clay of latest Pleistocene and Holocene age, recording riverine drainage along the valley axis. Immediately surrounding Lake Elsinore is a broad

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[1]/ Kirby, Matthew E. and Anderson, Michael, Developing a Baseline of Natural Lake-Level/Hydrologic Variability and Understanding Past Versus Present Lake Productivity Over the Late-Holocene: A Paleo-Perspective for Management of Modern Lake Elsinore, A Final Contract Report to the Lake Elsinore and San Jacinto Watershed Authority, March 2005, pp. 18-20.

[2]/ Morton, Douglas M. and Miller, Fred, Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangle, California, Open File Report 2006-1217, United States Geological Survey, 2006.

expanse of late Holocene lake deposits consisting of grey, fine-grained sediments (clay, silt, and fine-grained sand) documenting the lake's former extent."[3]

As further noted therein, as illustrated in Figure E.6-3 and indicated in Table E. 6-1, the City and surrounding areas have the potential to experience significant groundshaking as a result of seismic activities on a number of active faults. Figure E.6-4 presents a generalized map of liquefaction potential based on data on file with the City.

Table E. 6-1: Maximum Credible Earthquakes and Recurrence Intervals Table E.6- 1for Key Southern California Faults

Fault	Magnitude of Maximum Credible Earthquake	Approximate Recurrence Interval
Newport-Inglewood	MW 6.0 – 7.4	Unknown
Whittier	MW 6.0 – 7.2	Unknown
Raymond Hill	MW 6.0 – 7.0	Unknown
Cucamonga	MW 6.0 – 7.0	Estimated at 600-700 years
Elsinore	MW 6.5 – 7.5	250
San Jacinto	MW 6.5 – 7.5	100-300 years on each segment
San Andreas	MW 6.8 – 8.0	Ranges from less than 20 years at Parkfield in the north to more than 300 years; Averages about 140 years on Mojave segment of fault
North Frontal fault of the San Bernardino Mountains	MW 6.0 – 7.1	Uncertain
Pinto Mountain	MW 6.5 – 7.5	Uncertain
Kickapoo (source of 1992 M7.3 Landers earthquake)	M1 4.8 – 7.5	Uncertain; Probably about 7,000 years

Notes:
MW = Richter (local) magnitude M1 = Moment magnitude

Source: City of Lake Elsinore

6.1.2 United States Geological Survey Geologic Maps.

With the exception of the Talega-Escondido 69/230-kV transmission ("T–E Line") upgrade and a segment of the southern primary transmission line (located within the area of the USGS 7.5-Minute Wildomar quadrangle), the Project area is presented on one or more of the included USGS maps. The source map scales differ and, because each map has a separate key (legend), those source documents should be consulted.

[3]/ *Id.*, City of Lake Elsinore General Plan, Background Reports, pp. 12-6 and 12-7.

- **30x60-Minute Santa Ana Quadrangle**.[4] A preliminary geologic map of the Santa Ana 30 X 60-Minute USGS quadrangle is included, in part, as Figure E.6-5: Preliminary Geologic Map Santa Ana 30' x 60' USGS Quadrangle (1999).[5]

  In total, the quadrangle covers an area of about 2,000 square miles in southeastern Los Angeles, most of Orange, and southwestern Riverside Counties. As illustrated, a portion of the Project is located in and proximal to the Elsinore Mountains of the Santa Ana Mountain Range, which form the northernmost range of the Peninsular Ranges Province. The Peninsular Ranges Province is characterized by a northwest-striking geologic fabric (faulting and folding) influenced by the San Andreas tectonic regime.

  Physiographically, as illustrated in Figure E.6-1 and in Figure E.6-6,[6] the northern part of the Peninsular Ranges Province is divided into three major, fault-bounded blocks: the Santa Ana Mountains, Perris, and San Jacinto Mountains. The Santa Ana Mountains block is the westernmost of the three, extending eastward from the coast to the Elsinore fault zone. Tertiary sedimentary rocks, ranging in age from Paleocene through Pliocene, underlie most of the western part of this block.

  East of these tertiary rocks, in the Santa Ana Mountains, a highly faulted anticlinal structure is cored by a basement assemblage of Mesozoic meta-sedimentary and Cretaceous volcanic and batholithic rocks. Overlying this basement is a thick section of primarily upper Cretaceous marine and Paleocene marine and non-marine rocks. In the southern part of the Santa Ana Mountains, the anticlinal nature of the mountains passes into an extensive, nearly horizontal erosional surface that is partly covered by Miocene basalt flows. Over the top of this basement assemblage is a thick section of primarily upper Cretaceous marine rocks and Paleocene marine and non-marine rocks.

- **San Bernardino and Santa Ana 30x60-Minute Quadrangles.** A geologic map of a portion of the San Bernardino and Santa Ana 30' x 60' Quadrangles is included in Figure E.6-7.[7] As more thoroughly described therein, the Santa Ana Mountains block is divided longitudinally into an eastern half consisting of the Puente Hills and the Santa Ana Mountains and a western half of relatively low-lying sedimentary rocks extending west from the flank of the Santa Ana Mountains to the coast.

  The tectonic development of the Santa Ana Mountains anticline appears to be the result of the angular discordance between the strike of the Elsinore fault and the more westerly striking Whittier fault. The length of the Santa Ana Mountains elevated by the discordance between the two faults extends south of the Santa Ana River about 35 kilometers (km). Further south, the summit elevation decreases to 600-800 m over a distance of about 12 km where it is the near-horizontal, low-relief Santa Rosa Plateau.

  The Santa Ana Mountains consist of three topographically distinct segments. All three segments are bounded on the east by a steep escarpment along the Elsinore fault zone. The northern segment extends southward to the north end of Lake Elsinore at Leach Canyon where there is a distinct job in the mountain front. The east flank of the mountains is deeply dissected and the crest of the range is at elevation of 1200-1700 meters above msl. Drainages extend four to six km into the mountains from

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4/ Morton, D.M., Preliminary Digital Geologic Map of the Santa Ana 30' X 60' Quadrangle, Southern California, Version 1.0, Open-File Report 99-172, United States Geological Survey, 1999.

5/ Readers should refer to the published USGS geology map for a description of the legend.

6/ Morton, Douglas M. and Weber, Harold F. Jr., Geology Map of the Lake Mathews 7.5- Quadrangle, Riverside County, California, Open-File Report 01-479, United States Geological Survey, 2001.

7/ Morton, Douglas M. and Miller, Fred, Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangle, California, Open File Report 2006-1217, United States Geological Survey, 2006.

the eastern margin and head against extensively developed drainages on the west flank of the mountains. On the west side of the mountains, the northern segment extends south to the upper part of Hot Springs Canyon.

The east face of the central segment between Leach Canyon to about Slaughterhouse Canyon drainage basin area is moderately dissected but more subdued that the northern segment. Summit elevations are about 1000-1100-meters above msl, the highest elevation is Elsinore Peak (1090-meters above msl). The physiography of the central segment is a broad low relief area having short, steep gradient drainages extending about two to three km from the east margin of the mountains and that are paired with extensive drainages on the western slope. There is no sharp difference between the north and central segments on the west side of the mountains.

The Perris block is a rectangular-shaped block, has low relief, and is bounded on the east by the San Jacinto fault zone and on the west by the Elsinore fault zone. The northwestern part of the block is somewhat ill-defined north of City of Corona where the Elsinore fault becomes the more westward striking Whittier fault and in the Pomona-San Jose Hills area where it is poorly defined beneath thick Quaternary and Tertiary cover. The Perris block consists of two distinct parts, a northern and a southern part. Upstream from Corona, the northern part consists of the largely alluvial valley area of the Santa Ana River. The southern part of the block consists of widespread exposures of basement and a series of interconnected alleviated valley areas. Most elevations range from 450-700 m above msl.

As illustrated in Figure E.6-8,[8] a number of fault bounded basins are located along the margin of the Perris block and within adjacent blocks. A number of pull-apart basins are located along the Elsinore fault zone; most notably, the Elsinore basin, a relatively shallow depression bounded on the northeast by the Willard fault and on the southwest by the Wildomar fault, both segments of the Elsinore fault zone. The Elsinore fault zone consists of a complex assemblage of right-stepping and left-stepping echelon faults. Movement on these faults have produced a series of extensional basins that, in aggregate, result in an elongate, composite, structural trough. The trough includes numerous minor compressional uplifted domains, some of which separate the constituent extensional basins. The largest of these extensional basins, the Elsinore structural basin, is largely filled by Lake Elsinore.

In the vicinity of the City of Corona, the Elsinore fault zone either branches into or intersects two independent faults, the Whittier fault which has a more westerly strike and the Chino fault which continues for about 15 km with the same strike as the Elsinore fault. The juncture of these faults is obscured beneath young alluvium. The Elsinore, Whittier, and Chino fault zones have commonly been combined as a single, related fault complex. North of Wildomar, the Hot Springs fault is considered to be a branch of the Elsinore fault zone. Estimates of lateral displacement along the Elsinore fault zone vary widely.

- **7.5-Minute Elsinore Quadrangle**.[9] A preliminary geologic map of the Elsinore 7.5-Minute USGS Topographic Quadrangles has been released by the USGS and is included, in part, as Figure E.6-9. The 7.5-minute quadrangle covers an area of about 62 square miles in southwestern Riverside County. The Elsinore quadrangle is located in the northern part of the Peninsular Ranges Province and includes parts of two structural blocks, or structural subdivisions of the province. The active Elsinore fault zone

8/ Morton, Douglas M. and Miller, Fred, Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangle, California, Major Faults, Open File Report 2006-1217, United States Geological Survey, 2006.

9/ Morton, D.M, and Weber, F.H., Preliminary Geologic Map of the Elsinore 7.5' Quadrangle, Riverside County, California: United States Geological Survey Open-File Report OF 03-281, 2003; Morton D.M. and Weber, F.H., Geologic Map of the Elsinore Quadrangle, Southern California: United States Geological Survey Open-File Report 90-700, 1991.

diagonally crosses the southwest corner of the quadrangle and is a major element of the right-lateral strike-slip San Andreas fault system. The Elsinore fault zone separates the Santa Ana Mountains block west of the fault zone from the Perris block to the east. Internally, both blocks are relatively stable and within the quadrangle are characterized by the presence of widespread erosional surfaces of low relief.

Within the quadrangle, the Santa Ana Mountains block is underlain by undifferentiated granitic rocks of the Cretaceous Peninsular Ranges batholith but, to the west, includes widespread pre-batholithic Mesozoic rocks. The Perris block is underlain by a combination of batholithic and prebatholithic rocks, the latter consisting of metasedimentary rocks of low metamorphic grade; sub-greenschist grade. The most abundant lithology is phyllite but includes locally thick sections of impure quartzite. Minor sills, dikes, and small elongate plutons of fine-grained hornblende gabbro intrude the phyllite. Thin layers of tremolite-bearing marble occur locally. Also local are thin layers of manganese-bearing rocks. Both rhodonite and manganese oxides occur in these layers. The phyllite has a regular northwest strike throughout the main body of metamorphic rock, giving rise to a homoclinal section over 25,000-feet thick. The layering-schistocity of these rocks is transposed bedding.

In the northwest corner of the quadrangle is a series of Cretaceous volcanic and associated sedimentary rocks containing widespread primary sedimentary structures that appears to post date the metamorphism of the phyllite. The volcanic rocks are part of the Estelle Mountain volcanics of primarily rhyolitic composition. The sedimentary rocks are well indurated, perhaps incipiently metamorphosed, siliceous rocks containing local conglomerate beds.

Within the quadrangle are parts of three plutonic complexes, all part of the composite Peninsular Ranges batholith. In the southeast corner is the northwest part of the Paloma Valley ring complex, which is elliptical in plan view and consists of an older ring-dike and two subsidiary short-arced dikes that were emplaced into gabbro by magmatic stoping. Small to large stoped blocks of gabbro are common within the ring-dikes. A younger ring-set, made up of hundreds of thin pegmatite dikes, occur largely within the central part of the complex. Only the northern part of the older ring dike occurs within the quadrangle. Stoped gabbro masses occur near the southeast margin of the quadrangle.

In the northern part of the quadrangle is the southern part of the composite Gavilan ring complex of mostly tonalite composition. Hypersthene, although not usual in tonalite in the batholith, is a characteristic mineral of most of the rock of this complex. The Gavilan ring complex is a shallow intrusive that appears to be tilted up to the northeast. Fabric of the rocks changes in texture from hypauthomorphic-granular in the east to semiporphyritic in the west. The main part of the complex appears to have been emplaced by magmatic stoping. Several inactive gold mines (e.g., Goodhope, Gavilan, Santa Rosa) are located within the complex. Within the Gavilan ring complex is the south-half of the Arroyo del Toro pluton. This near circular-in-plan pluton consists of massive-textured granodiorite that is essentially devoid of inclusions, and at one time was quarried for building stone.

The Elsinore fault zone forms a complex series of pull-apart basins. The largest and most pronounced of these pull-apart basins forms a flat-floored closed depression (La Laguna) which is partly filled by Lake Elsinore. This basin forms the terminus for the San Jacinto River. During excessively wet periods the La Laguna fills and the overflow passes through Warm Springs Valley into Temescal Wash, before joining the Santa Ana River in the City of Corona. La Laguna, bounded by active faults, is flanked by both Pleistocene and Holocene alluvial fans emanating from both the Perris block and the Santa Ana Mountains. North of La Laguna are exposures of the Paleocene Silverado Formation. Clay beds of the Silverado Formation have been an important source of clay. Overlying the Silverado Formation are discontinuous exposures of conglomeratic younger Tertiary sedimentary rocks that are tentatively correlated with the Pauba Formation.[10]

- **15-Minute Lake Elsinore Quadrangle**.[11] The Lake Elsinore 15-minute quadrangle coves about 250 square miles and includes parts of the southwest margin of the Perris Block, the Elsinore trough, the southeastern end of the Santa Ana Mountains, and the Elsinore Mountains. The oldest rocks consist of an assemblage of metamorphics of igneous effusive and sedimentary origin. They are intruded by diorite and various hypabyssal rocks, then in turn by granitic rocks which occupy over 40 percent of the area. Following the last igneous activity of probable Lower Cretaceous age, an extended period of sedimentation started with the deposition of the marine Upper Cretaceous Chico formation and continued during the Paloecene under alternating marine and continental conditions on the margins of the block. A marine regression towards the north, during the Neocene, accounts for the younger Tertiary strata in the region. Outpourings of basalts to the southeast indicates that igneous activity was resumed toward the close of the Tertiary.

  The fault zone which characterizes the Elsinore trough marks one of the major tectonic lines of southern California. It separates the upthrown and tilted block of the Santa Ana Mountains to the south from the Perris Block to the north. Most of the faults are normal in type and nearly parallel to the general trend of the trough or intersect each other at an acute angle. Vertical displacement generally exceeds horizontal and several periods of activity are recognized.[12] The principal structural element of the Elsinore trough consists of a system of faults which can be divided into two major groups: (1) piedmont or longitudinal faults, forming the northeast and southwest boundaries of the trough and separating it from the highlands of the Perris and Santa Ana-Elsinore Mountain blocks, respectively; and (2) internal or transverse faults which are between and intersect the faults of the first group.

  The major piedmont or longitudinal faults that may be traversed by either the proposed lines, penstocks, and tailrace systems are illustrated, in part, in Figure E.6-10 and are briefly described below.

  - **Glen Ivy fault zone**. The Glen Ivy fault zone is a prominent feature that enters the Lake Elsinore quadrangle in the northwest corner near Glen Ivy Hot Springs and extends southeast toward Lucerne at the northwest end of the lake. About one mile northwest of this point, the fault zone leaves the margin of the Santa Ana-Elsinore Mountain block to pass under the alluvium and crosses the trough along the Clevelin Hills on the northeast side of Lake Elsinore. It disappears again under the alluvium and the fanglomerate at the southeast end of the lake. The northwestern segment of this fault zone, between Glen Ivy and Lucerne, represents the piedmont fault system on the northeast side of the Santa Ana Mountain block. It consists of several parallel to sub-parallel step faults that correspond to different lines of breaks, kerncols, and kernbuts. These faults can be traced only for distances of less than a mile and appear to be en echelon or to intersect each other at acute angles. This fault zone is as much as a quarter of a mile wide and apparently decreases in width toward the southeast.[13]

10/ Morton, Douglas M. and Weber, F. Harold Jr., Preliminary Geologic Map of the Elsinore 7.5' Quadrangle, Riverside County, California, United States Geological Survey Open-File Report OF 03-281, 2003, pp. 8-9.

11/ Id.., Geology of the Lake Elsinore Quadrangle, California, Geology and Mineral Resources of the Lake Elsinore Quadrangle, California, California Division of Mines and Geology, Bulletin 146, 1959.

12/ Id., pp. 9-10.

13/ *Id*., pp. 52-53.

- **Willard fault zone.** The Willard fault zone forms the northwest face of the Elsinore Mountains and extends southeasterward to the end of the Elsinore trough south of Temecula where it ends against the Agua Tibia Mountains. The fault line is well marked by the bold scarp of the Elsinore Mountains. It is traceable as a straight line for about 11 miles and is marked at a few places by triangular facets. The recency of the movements of this fault or its parallel subsidiaries is shown by small hills and knolls detached form some of the mountain spurs. The fault zone consists of several major faults. The first is marked by a slope break at an elevation of 1450-feet above msl and is entirely in metamorphic rocks. The second lies along the contact between the metamorphic rocks and quartz diorite at an elevation of about 1700 feet above msl. The third is shown by a slope break encountered in quartz diorite at an elevation of 1850 feet above msl, where an extensive line of kernbuts and cols lie along the mountain face. Another slope break marked yet another fault is at an elevation of about 2100 feet above msl and probably represents the southern limit of the fault zone. The straightness of the fault line suggests that the dip of the fault surface is nearly vertical or steeply dipping to the northeast. On the upthrown side of this fault is the Elsinore Mountain block to the southwest and on the downthrown side is the Elsinore trough to the northeast.[14]
- **Tenaja fault.** The Tenaja fault is a reverse fault, with a general tilt to the southeast, caused by hinge line adjustments of the Santa Ana-Elsinore Mountain block during its elevation on the northeast side of the Elsinore trough.
- **Los Pinos fault.** This fault is a straight-line feature extending from Hot Springs Canyon to the Elsinore trough, separating the Los Pinos Peak block to the north on the upthrown side from the Potrero de los Pinos block on the downthrown side to the south. The fault is evidenced by abrupt termination of rock patches at its trace, prominent physiographic alignments, and some fracture zones.
- **Harris fault.** The Harris fault is a prominent feature and can be traced from about eight miles either through displacements of outcrops or physiographic features.[15]

- **Other USGS Geologic Maps.** USGS geologic maps depicting the area of the proposed Case Springs Substation and a portion of the proposed southern primary transmission line, are presented, in part, in Figure E.6-11.[16] A USGS geologic map depicting the easterly portion of the T–E Line upgrade, including the Escondido Substation, is presented, in part, in Figure E.6-13. The Oceanside 30x60-minute quadrangle is a compilation of the more detailed Margarita Peak, Fallbrook, Temecula, Pechanga, Pala, Valley Center, and Escondido 7.5-minute quadrangles. Because the proposed 230-kV transmission line upgrades will be constructed on existing towers and on involve existing facilities, the more detailed USGS geologic maps are not presented herein.

6.2 Regional Geology.

There are eleven geomorphic provinces in California. The Peninsular Ranges Geomorphic Province encompasses the area of the Project in western Riverside and northern San Diego Counties. The

[14]/ *Id*., p. 54.

[15]/ *Id*., pp. 56-57.

[16]/ Tan, Siang S., Geologic Map of the Fallbrook 7.5’ Quadrangle, San Diego and Riverside Counties, California: A Digital Database, California Division of Mines and Geology, 2000; Tan, Siang S., Geologic Map of the Margarita Peak 7.5’ Quadrangle, San Diego County, California: A Digital Database, California Division of Mines and Geology, 2001; Tan, Siang S., Geologic maps of the Northwestern Part of San Diego County, California, Open-File Report 96-02, California Division of Mines and Geology, 1996.

Peninsular Ranges Province terminates at the Transverse Ranges Province at the north, in the area of the San Jacinto Mountains. This province is a well-defined geologic and physiographic unit characterized by elongated ranges and valleys with a general northwesterly trend. The Project spans the boundary between two geologic environments - an actively subsiding fault-bounded basin (Elsinore Basin) containing Lake Elsinore and a more stable mountain block underlain by minor metamorphic rocks and undivided granitic rocks. The Elsinore Mountains are a portion of the Santa Ana Mountain Range, which form the northernmost range of the Peninsular Ranges Province. The Peninsular Ranges Province is characterized by a northwest-striking geologic fabric (faulting and folding) influenced by the San Andreas tectonic regime.

The Elsinore Basin is located in the southeast part of the Los Angeles Basin. The Los Angeles Basin is a region of alluvial outwash, encompassing most of Los Angeles and Orange Counties, as well as western Riverside and San Bernardino Counties. The Elsinore Basin is a down-faulted (trough) portion of the earth's crust about 8 miles long and between 2-3 miles wide. The long axis of the valley parallels the northwesterly regional structural trend and rugged hills and mountains border the basin on all but the southeastern side. The lowest portion of the basin floor is a broad, relatively flat area known as "La Laguna," which is partially occupied by Lake Elsinore. La Laguna forms the terminus for the San Jacinto River, which flows into the Elsinore Basin from the northeast. To the southwest, are the steep slopes of the Elsinore Mountains. The northeastern edge of the basin is bordered by the Sedco and Cleveland Hills, part of the Temescal Mountain range. The Elsinore (Glen Ivy) fault parallels the base of the Cleveland Hills and marks the structural edge of the basin in this area. The southeastern end of the basin is formed by a low alluvial divide built up by streams draining the Elsinore Mountains.

Lake Elsinore is a structural depression formed within a graben along the Elsinore fault. Geologically, Lake Elsinore is surrounded by a combination of igneous and metamorphic rocks, some of which outcrop in the lake's littoral zone along the northern edge. Lake Elsinore is constrained along its southern edge by the steep, deeply incised Elsinore Mountains. The San Jacinto Mountains lie about 70 km to the northeast of Lake Elsinore.

The geology of the Elsinore Valley comprises essentially three major units. At the surface lies alluvium from a variety of sources. Underneath the surface alluvium, is the sedimentary Pauba Formation. Under that lies the "basement rocks" of the Peninsular Ranges Batholith. The alluvial formation covers the lower portions of the valley and can be divided into alluvial fan deposits, floodplain deposits, and recent lacustrine deposits.

As illustrated in Figure E.6-14, most of the soils in Elsinore Valley surrounding Lake Elsinore are of the Hanford-Tujunga-Greenfield association. These soils are generally sandy loams, loamy sands, although some areas contain loams and coarse sandy loams with gravel and cobble. Erosivity of these soils generally ranges from slight to moderate; however, wind-caused erosion can be high in some areas. Permeability is generally moderate to rapid and the shrink-swell potential is low. Soil depths range can reach 60 inches. The soils in the back basins of Lake Elsinore are primarily Waukena loamy fine sand and Willows silty clay with some Traver loamy fine sand. All three of these soils are saline-alkali soils because of the repeated wetting and drying of these lakebed soils, as well as accumulation of salts. Wind-caused erosion of these finer (silt and clay) soils is assumed to be moderate to high. Soils to the west of Lake Elsinore at the location of the proposed powerhouse sites are Hanford sandy loams. These soils are generally well-drained soils on alluvial fans and alluvial plains formed of granitic alluvium. Permeability is moderate and, if the soil is bare, runoff is slow to moderate and the erosion hazard is slight to moderate.

As illustrated in Figure E.6-16[17] there are three distinct soil types in the vicinity of the proposed Decker Canyon upper reservoir. In the canyon bottom, the soil is Blasingame-Vista complex. This moderately steep mapping unit is about 50 percent Blasingame loam and 40 percent Vista course sandy loam. The Blasingame series consists of well drained soils in the mountains. These soils formed in material weathered from metamorphic or granitic rocks. The soil is moderately slowly permeable. The Vista series consists of well-drained soils in the mountains. The soil is moderately rapidly permeable. The upslope area consists of well-drained Las Posas series soils formed in material weathered from gabbro. Permeability is moderately slow. Adjoining slopes are Cieneba-Blasiname-Rock outcrop complex. This strongly sloping to moderately steep mapping unit is about 35 percent Cieneba sandy loam, 30 percent Blasingame loam, and 25 percent rock outcrop and large boulders. If soil is bare, runoff is rapid and the erosion hazard is high.

Most of the primary transmission line alignments travel through mountainous or hilly terrain. Soil conditions can vary markedly between specific sites; however, along these alignments the dominant soil series include the Cieneba and Friant series. The Friant Series consists of somewhat excessively drained soils that formed in the mountains from material weathered from fine-grained metasedimentary rock. Slopes are generally steep and range from 30 to 70 percent. A typical Friant soil is a shallow, gravelly fine sandy loam with rock outcrops. Permeability is moderately rapid and, if the soil is bare, runoff is rapid and the erosion hazard is high. The Cieneba Series comprises shallow, somewhat excessively drained sandy loams on steep to very steep slopes. Some soils in this series are only 5-15 inches deep over bedrock. Gullies cut through these soils, and intermittent drainage channels and small landslides are common. Bare soil is susceptible to rapid runoff, and the erosion hazard is high.

The soils found in proximity to SR-74 (Ortega Highway), as it parallels San Juan Creek include calcareous loamy sands and fine sandy loams soils that are on nearly level ground, alluvial fans and floodplains, along with pockets of moderately well-drained sandy loams with strongly developed subsoil occurring on terraces and level to moderately steep ground.

As illustrated in Figure E.6-17, excluding those areas located within the Congressional boundaries of the CNF (which were not included in surveys performed by the Soil Conservation Service), there are two distinct soil types in the vicinity of the proposed Santa Rosa Substation and Powerhouse sites.[18] North of the CNF boundaries, in the vicinity of the Santa Rosa Substation and Powerhouse sites, the dominant soils type is Honcut series. The Honcut series are well-drained soils on alluvial fans. These soils developed in alluvium from dominantly basic igneous rocks. In the typical profile, the surface layer is dark-brown sandy loam about 22 inches thick. The underlying material is brown fine sandy loam or sandy loam and extends to a depth greater than 60 inches. Vegetation is chiefly annual grasses, forbs, and chamise. Runoff is medium and the hazard of erosion is moderate. Near the shoreline, Grangeville series soils are identified. The Grangeville series consists of moderately well drained to poorly drained soils on alluvial fans and floodplains. These soils developed in alluvium from granitic materials. The vegetation is chiefly annual grasses, saltgrass, and forbs. In a typical profile, the surface layer is grayish-brown loamy find sand and loamy very fine sand about 17 inches thick. The underlying layers are stratified and range from grayish brown to light brownish gray in color and from loamy fine to very fine sandy loam in texture. Runoff is medium and the hazard of erosion is moderate.

[17]/ Soil Conservation Service, Soil Survey of Orange County and Western Part of Riverside County, California, United States Department of Agriculture, 1978.

[18]/ Soil Conservation Service, Soil Survey of Western Riverside Area, California, United States Department of Agriculture, November 1971.

In general, the Camp Pendleton area is underlain by Holocene to late Pleistocene unconsolidated sedimentary deposits that include alluvium in canyon bottoms and coastal terraces, Eocene to Pliocent sedimentary rocks of marine and non-marine origin, and Cretaceous to Triassic bedrock that includes highly consolidated and cemented sedimentary rock and plutonic and metamorphic crystalline rock.

6.3 Geologic Hazards.

Potential geologic hazards include ground rupture from active faulting, strong ground motions from earthquakes, landslides or rockfalls (induced by earthquake, rainfall and saturation, or other triggers), liquefaction and seismic settlement, and debris flows.

As previously described, the Elsinore Valley is a complexly faulted trough formed by the movement along a series of parallel northwest-trending faults. This Elsinore fault zone, illustrated in Figure E.6-18,[19] is a part of the Whittier-Elsinore fault system. The parallel series of faults within this zone includes the Willard, Rome Hill, Wildomar, Lake, Burchkhalter, Sedco, Glen Ivy, and Freeway faults. The three main faults within the Elsinore Valley are the Willard, Wildomar, and Glen Ivy faults. These faults appear very young in age, evidenced by features such as the steep northeast side of the Elsinore Mountains to the southwest of Lake Elsinore. At its northern end, the Elsinore fault zone splays into two segments, the Chino fault and the Whittier fault. At its southern end, the Elsinore fault is cut by the Yuha Wells fault from what amounts to its southern continuation, the Laguna Salada fault.

The Elsinore fault in southern California is a part of the San Andreas system of faults and runs southeast from the Los Angeles basin for approximately 250 km to the border of Mexico, where it continues southeast as the Laguna Salada fault. To the east are the San Jacinto and San Andreas fault zones and faults associated with the Eastern California Shear Zone. To the west is the Newport - Inglewood - Rose Canyon fault zone, which only locally comes on shore, and the offshore zone of deformation including the Coronado Bank, San Diego Trough and San Clemente faults. A comparison of the Elsinore and San Jacinto fault zones suggests that the Elsinore fault may produce larger, less frequent earthquakes on longer segments than the nearby San Jacinto fault zone.

It is estimated that the Elsinore fault accommodates 10-15 percent of the plate-boundary slip in southern California. Previous work on the Elsinore fault has established the late Quaternary slip rate at about 4.5 to 5.5 millimeters per year (mm/yr), apparently decreasing to the southeast. The fault has been divided into five major segments, based on geometry and geomorphology, which are from north to south, the Whittier, Glen Ivy, Wildomar-Wolf Valley-Pala-Temecula, Julian, and Coyote Mountain segments. Geologic study of the past behavior of this fault reveals that it is capable of producing large earthquakes and, therefore, poses a major potential seismic hazard to southern California. The Elsinore fault zone is segmented. The central part of the fault zone near Julian fails infrequently in large (M7.5) earthquakes, on the average of several thousand years, with the most recent earthquake having occurred 1.5-2 thousand years ago. The adjoining segment to the north, from near Pala to Lake Elsinore, ruptures more frequently in M7 sized events about every 600 years, with the most recent large earthquake between A.D. 1655 and 1810.[20]

The southeastern extension of the Elsinore fault zone (the Laguna Salada fault) ruptured in 1892 in a magnitude 7 earthquake, as measured on the Richter scale; however, the main trace of the Elsinore fault zone has only seen one historical event greater than magnitude 5.2, a magnitude 6 earthquake near

[19]/ Wallace, Robert E. (ed), The San Andreas Fault System, Second Printing, United States Geological Survey, 1991.

[20]/ Thorup, Kimberly M., Paleoseismology of the Central Elsinore Fault in Southern California: Results from Three Trench Sites, United States Geological Survey, 1997.

Temescal Valley on May 15, 1910, northwest of Lake Elsinore, which produced no known surface rupture and did little recorded damage.

The Elsinore fault zone separates the upthrown and tilted block of the Santa Ana Mountains west of the fault zone from the Perris block to the east. Internally, both blocks themselves are relatively stable. This is evidenced by the presence of widespread erosional surfaces of low relief. Most faults within the Elsinore fault zone are normal in type and nearly parallel to the general trend of the trough or intersect each other at an acute angle. Vertical displacement generally exceeds horizontal, and several periods of activity are recognized. Research studies have been conducted to assess faulting on most of the sections and have documented Holocene activity for the length of the fault zone with a slip rate around 4-5 millimeter per year. Multiple events have only been dated on the Whittier fault and Glen Ivy North fault strand, so interaction between faults and adjacent sections is not well-known. The west edge of the fault zone, the Willard fault, is marked by the high, steep eastern face of the Santa Ana Mountains. The east side of the zone, the Wildomar fault, forms a less pronounced physiographic step.[21]

The Elsinore fault zone forms a complex of pull-apart basins. The principal structural element of the Elsinore trough is a system of faults that can be divided into two major groups: piedmont or longitudinal faults, forming the northeast and southwest boundaries of the trough; and internal or transverse faults, which are between the faults of the first group and intersect them. In addition, a number of major faults are located within the Santa Ana-Elsinore Mountain block. The closest faults to the proposed Powerhouse site are the Willard and Wildomar faults, located west of Lake Elsinore, considered right-lateral, strike-slip faults. As illustrated in Figure E.6-19, the Wildomar fault is mapped within the limits of Lake Elsinore. While the Willard and Wildomar faults are not identified as "active" (ground rupture during Holocene time), portions of the Elsinore fault zone have been designated as "active" by the State of California.[22]

Geomorphic evidence of active faulting has been identified along the traces of the Willard and Wildomar faults. If a moderate to large earthquake were to occur on the Elsinore fault, the Willard fault area could be the primary site of potential ground surface rupture and significant lateral displacement. The potential lateral displacement of this fault in a magnitude 7-7.5 earthquake, as measured on the Richter scale, is estimated to be in the order of 5-16 feet.

As assessment of seismic activity along the Elsinore fault zone splays located along the south side of Lake Elsinore was presented in a technical report prepared for the Geological Society of North America. As noted therein: "At Lake Elsinore (Riverside County), the Elsinore Fault Zone (EFZ) forms a ~2-km wide, right-oblique, transtensional, pull-apart tectonic basin bordered by the active (Holocene) Glen Ivy North and Glen Ivy South faults on the north and the Willard and Wildomar faults on the south. Immediately south of Lake Elsinore, the structural relationships and relative activity of these faults have heretofore been poorly constrained owing to a lack of geomorphic expression and to a ~10-m thick cover of late Pleistocene and Holocene lacustrine and fluvial (San Jacinto River) distal fan and deltaic deposits. Now, however, interpretations of data from new 20 to 30-m deep cone penetrometer test soundings and continuous borings, from seismic refraction logs, from soil-stratigraphic documentation of unbroken

[21]/ Kennedy, Michael P. and Morton, Douglas M., Preliminary Geologic Map of the Murrieta 7.5' Quadrangle, Riverside County, California, Open-File Report OF 03-189, United States Geological Survey, 2003, p. 9.

[22]/ The Willard and Wildomar faults are not identified as "active" by the State of California. The Elsinore fault zone, however, is defined as active by the State of California and the Uniform Building Code (UBC, 1997) identifies the Willard and Wildomar faults as within the Glen Ivy segment of the Elsinore fault zone. Weber (1977) also identifies geomorphic evidence of active faulting along the traces of the Willard and Wildomar faults. Consequently, for conceptual-level purposes, the Willard and Wildomar faults should be considered active (Source: GENTERRA Consultants, Inc., Geotechnical Feasibility Report – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, Riverside, California, August 28, 2003). These reports are available in Volume 12 of this application.

paleosols and other stratigraphic markers exposed in up to 12-m deep trenches, and from several internally consistent radiocarbon dates and related rates of fine-grained sedimentation, we determine that last displacement of pull-apart faults in a subsurface, ~60-m wide zone, occurred about 33 to 39 ka ago. The subsurface faults are right stepping and decrease in displacement to the south. We interpret these faults as the bifurcating and 'dying out' southern extension of the Glen Ivy North fault, which has demonstrable Holocene offset some 18 km to the north. Accordingly, most neotectonic slip on the south side of Lake Elsinore is now likely taken up by the Wildomar fault zone, expressed geomorphically by the nearby transpressional horst of Rome Hill and by escarpments along the east side of the Elsinore Trough at Murrieta and Temecula. Accordingly, previous southward projections and inferred Holocene activity of the Glen Ivy faults on the east and south side of Lake Elsinore now appear to be unfounded."[23]

As illustrated in Figure E.6-20 and as indicated in the City's "Background Reports," a substantial portion of the City and surrounding areas is located on slopes 30 percent or greater, representing areas at "substantial risk of seismically induced slope failure."[24] Under certain conditions, strong ground motions can cause loose, sandy soils to liquefy and settle. These soft, fine-grained sediments can lose strength under such strong ground motions. The fine-grained sediments associated with the young lake deposits of Lake Elsinore could have the potential for liquefaction and seismic settling. Because the proposed location for the tailrace structure are located on the shores of Lake Elsinore, segments of these hydropower components could be founded on materials susceptible to liquefaction and seismic settling.

Debris flows are a common and widespread phenomenon during periods of intensive winter rainfall in southern California. Most debris flows occur during winters with above normal rainfall, especially during "El Nino" winters. They can cause considerable damage and result in loss of life. These debris flows originate as small, shallow landslides, commonly referred to as soil slip. Most soil slips initiate as debris slide blocks with a form of an elliptical-shaped slab. Debris slide blocks are a form of translational slides. Most soil slips deaggregate into debris flows, fluid slurries of soil and rock detritus that commonly converge in stream channels, where they flow down channel at various speeds for various distances. Unlike bedrock or deep-seated landslides that are generally recognizable for long periods of time, soil-slip debris flow scars quickly absorb into the ambient physiography leaving little record of their prior existence. The most lasting record of debris flows are deposits that accumulate on fans or as relatively steep ravine or gully fill.

Soil-slips pose relatively little hazard at the sites of initial failure but the debris flows that form from them can be a serious hazard to people and structures in their flow paths. As illustrated in Figure E.6-21, the USGS has prepared preliminary soil-slip susceptibility maps for the general Project area. These maps serve as a preliminary regional assessment of the relative susceptibility for initiating soil-slip debris flows during periods of intense winter rains. The soil-slip susceptibility maps identify those natural slopes most likely to be the sites of debris flow. Recently burned areas have exceptionally great potential for producing debris flows with little rainfall. Due to the change in physical properties of surface material during wildfires, any subsequent debris flow activity is markedly different from that of unburned areas. Surface material in recently burned areas is commonly hydrophobic and does not require saturation of the soil to form soil slips.[25]

23/ Shemon, Roy, J., The Location and Relative Activity of Elsinore Fault Zone Splays, South Shore of Lake Elsinore, Riverside County, California, 97th Annual Meeting of American Association of Petroleum Engineers, April 11, 2001.

24/ Id., Lake Elsinore General Plan Update, Geology and Mineral Resources Background Report, January 2006, p. 12-10.

25/ Morton, D.M., Alvarez, R.M., and Campbell, R.H., Preliminary Soil-Slip Susceptibility Maps, Southwestern California, Open File Report OF 03-17, California Geological Survey, 2003, pp. 3-4.

6.4 Geotechnical Feasibility Report.

The following information is derived from a feasibility-level geotechnical assessment of the proposed Project.[26] Additional design-level investigations will be required prior to the commencement of any construction activities. The feasibility-level analysis concluded that, based on the results of the investigation, from a geotechnical perspective, there are no apparent geotechnical constraints that would prevent the construction of the Project. The following information summarizes the report's findings regarding proposed facility sites.

- **Decker Canyon Reservoir.** The geological units at the proposed Decker Canyon Reservoir site include granitic bedrock, alluvium, and colluvium. The bedrock is mapped as granodiorite, quartzdiorite, and tonalite. These rocks are typically light gray medium to coarse grained, and moderately fractured. Weathering of the granitic rock is variable in the near-surface. This variability in weathering was evidenced by the observation of nearly unweathered granitic "corestones" surrounded by highly weathered intact bedrock.

  The granitic rocks are cut by occasional darker and finer-grained intrusive dikes. The intrusive dikes are typically more resistant to weathering. Alluvium was not observed and no thick accumulation of colluvium was noted. Erosion gullies into the sideslopes and base of Decker Canyon show only a minor amount (less than two inches) of soil development overlying intact bedrock. Evidence of groundwater near the surface was not observed during the geologic investigation.

- **Powerhouse and Santa Rosa Substation**. The proposed Powerhouse and Santa Rosa Substation is located between the base of the Elsinore Mountains and Lake Elsinore. The surface geologic unit is a relatively young alluvial fan deposit. It is anticipated that the alluvial fan deposits are underlain by granitic bedrock at depth.

  Geophysical surveys were performed at both the proposed Santa Rosa Substation and Powerhouse, and alternative Ortega Oaks Powerhouse sites.[27] Geophysical survey data at the Santa Rosa site found 10-30 feet of loose alluvial soils underlain by 60-125 feet of dense, unsaturated alluvial soils and/or weathered bedrock. Crystalline bedrock was encountered at depths ranging from 70-145 feet below the ground surface.

  Survey data at the alternative Ortega Oaks Powerhouse site indicates 10-20 feet of loose alluvial soils underlain by 20-50 feet of dense, unsaturated alluvial soils, which was underlain by 70-90 feet of saturated alluvial soils and/or weathered bedrock. Crystalline bedrock was encountered at depths ranging from 110-160 feet below the ground surface. For both sites, it is anticipated that granitic rock will be encountered above the required powerhouse depth.

- **Penstocks.** It is anticipated that the penstock between the upper reservoir and the powerhouse site will be excavated into granitic bedrock, similar to that described for the upper reservoir sites. The bedrock should generally be sound and competent, although faults, fractures, joints, and groundwater will likely be encountered during the excavation of the proposed shaft and tunnel components of the penstock.

- **Inlet/outlet structure.** Between the Powerhouse and Lake Elsinore, there are strands/splays of the active Elsinore fault zone. The strands consist of the Willard fault, near the base of the slope, and the

26/ GENTERRA Consultants, Inc., Geotechnical Feasibility Report – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, Riverside, California, August 28, 2003.These reports are available in volume 12 of this application

27/ Although eliminated from consideration as the primary powerhouse location in the FEIS, mention is included here for completeness, as an alternative to the preferred powerhouse location.

Wildomar fault, mapped within the limits of Lake Elsinore. The Willard and Wildomar faults separate different geological units. Rock units are likely to be hard granitic rocks to the west of the faults with younger, less competent sedimentary deposits to the east of the faults. The proposed tailrace tunnel will extend from the proposed powerhouse (located on granitic bedrock), across the Willard fault and probably across the Wildomar fault into Lake Elsinore. It is anticipated that a portion of the tailrace tunnel will be constructed in soft or loose saturated sedimentary deposits.

- **Primary Transmission Lines**. The primary transmission lines connecting the Proposed Project to the grid would traverse the Elsinore (Glen Ivy) fault. Moderate to strong ground shaking should be expected in the event of an earthquake on the active Elsinore fault. Over its operational life, it is likely that the primary transmission facilities would be subjected to one or more moderate or larger earthquake occurring close enough to produce strong ground shaking. Portions of the primary transmission line would be subject to strong ground shaking with vertical and horizontal ground accelerations that could exceed lateral wind loads.

6.5 Geology and Soils Regulatory Setting

The following general discussion is presented of certain Federal, State, and local statutes and regulations that may be most applicable to an understanding of the Project's regulatory setting.

6.5.1 California Public Resources Code.

Prompted by damaging earthquakes in northern and southern California in 1990, the State Legislature passed the Seismic Hazards Mapping Act (SHMA), codified in Sections 2690 through 2699.6 in Division 2, Chapter 7.8 of the PRC, which became operative on April 1, 1991. The SHMA was adopted for the purpose of protecting the public from the effects of strong ground shaking, liquefaction, landslides and other ground failure, and other hazards attributable to earthquakes. As required under the SHMA, the California Department of Conservation, Division of Mines and Geology (DMG)[28] was directed to delineate the various "seismic hazard zones" throughout the State.

As specified under Section 2696(a) therein, the "State Geologist shall compile maps identifying seismic hazard zones, consistent with the requirements of Section 2695. The maps shall be compiled in accordance with a time schedule developed by the director and based upon the provisions of Section 2695 and the level of funding available to implement this chapter"

The SMGB's "Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication No. 117"[29] provides guidelines for evaluating and mitigating seismic hazards (other than surface fault rupture) and for recommending mitigation measures as required under Section 2695(a) of the PRC.[30] As specified therein: "The fact that a site lies outside a mapped zone of required investigation does not necessarily mean that the site is free from seismic or other geologic hazards, nor does it preclude lead

[28]/ Now the California Geological Survey (CGS).

[29]/ State Mining and Geology Board, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication No. 117, March 13, 1997.

[30]/ As defined in Section 2693(c) of the PRC, "mitigation" means those measures that are consistent with established practice and that will reduce seismic risk to acceptable levels." As further defined in Section 3721(a) therein, "acceptable level" means that level that provides reasonable protection of the public safety, though it does not necessarily ensure continued structural integrity and functionality of the project."

agencies from adopting regulations or procedures that require site-specific soil and/or geologic investigations and mitigation of seismic or other geologic hazards."[31]

Following the 1971 San Fernando earthquake, the State Legislature passed the Alquist-Priolo Earthquake Fault Zoning Act (APEFZA), formerly the Alquist-Priolo Special Studies Zone Act, codified in Section 2621 et seq. in Chapter 7.5 of Division 2 of the PRC. The APEFZA provides "policies and criteria to assist cities, counties, and state agencies in the exercise of their responsibilities to prohibit the location of developments and structures for human occupancy across the trace of active faults."[32] An "active fault" is one along which surface displacement has occurred within Holocene time (during the past 11,400 years).

The purpose of the APEFZA is to regulate land development near active faults in an effort to mitigate the hazard of surface fault rupture. The law requires the State Geologist to establish regulatory zones, known as "earthquake fault zones,"[33] around the surface traces of active faults and to issue appropriate maps. The zones are defined by turning points connected by straight lines. Most of the turning points are identified by roads, drainages, and other features on the ground. The zones vary in width, but average about one-quarter mile wide.[34] Under the APEFZA, local agencies must regulate activities within those zones, as defined by an appropriate setback from the fault trace. Pursuant to Section 2623 of the PRC, "cities and counties shall require, prior to the approval of a project, a geologic report defining and delineating any hazard of surface fault rupture. If the city or county finds that no undue hazard of that kind exists, the geologic report on the hazard may be waived, with the approval of the State Geologist." The geologic report required under the APEFZA must meet the criteria and policies established by the State Mining and Geology Board (SMGB), as codified in Sections 3600-3603 in Title 14 of the CCR. As indicated in the California Department of Conservation's guidelines: "Most surface faulting is confined to a relatively narrow zone a few feet to a few tens of feet wide, making avoidance (i.e., building setback) the most appropriate mitigation method."[35]

Under the APEFZA special studies zones are depicted in local areas within the USGS 7.5-minute Alberhill, Elsinore, and Wildomar topographic quadrangles. As illustrated in Figure E.6-22, a portion of the proposed Northern (Lake-Santa Rosa) transmission line traverses designated Alquist-Priolo special studies zones. With regard to the proposed 230-kV transmission line upgrade, the USGS 7.5-minute Temecula, Pala, Pechanga, and Wildomar quadrangles were examined and no Alquist-Priolo seismic hazard zones were identified along that alignment.

6.5.2 California Government Code.

The California Emergency Services Act (Section 8589.5, CGC) imposes specific emergency-planning requirements for populated areas downstream of dams and calls for the development of inundation maps

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[31]/ Op. Cit., Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication No. 117, p. 15.

[32]/ Section 2621.5(a), Chapter 7.5, Division 2, PRC.

[33]/ Earthquake fault zones are regulatory zones that encompass surface traces of active faults that have a potential for future surface rupture. Areas that are so designated contain active faults that may pose a risk of surface rupture to existing or future structures. If a property is undeveloped, a fault study may be required before the parcel can be subdivided or before most structures can be permitted. If a property is developed, the APEFZA requires that all real estate transactions within the earthquake fault zone must contain a disclosure of those potential hazards by the seller to prospective buyers.

[34]/ California Department of Conservation, Division of Mines and Geology, Fault-Rupture Hazard Zones in California, Special Publication 42, Revised 1997, Supplements 1 and 2 added in 1999, p. 6.

[35]/ California Department of Conservation, Guidelines for Evaluating the hazard of Surface Fault Rupture, Note 49, California Geological Survey, revised May 2002.

by the owners of all jurisdictional dams in the State. The inundation maps are based on a hypothetical dam failure, regardless of how small the probability of failure, making use of dam breaching parameters that will result in a conservative flood inundation map. As indicated, hazard analysis for dam failure should include the identification of high-risk areas, such as dam inundation areas, indicate what areas of adjoining jurisdictions may be affected by a dam failure, and develop individual dam inundation maps for each dam that could affect the jurisdiction or adjoining jurisdictions.

6.5.3 California Water Code.

As required under Section 6200 of the CWC, construction or enlargement of any new dam or reservoir shall not be commenced until the owner has applied for and obtained from the California Department of Water Resources - Division of Safety of Dams (DSOD) written approval of plans and specifications.[36] As required under Section 6120 therein, "for the purpose of enabling it to make decisions as compatible with economy and public safety as possible the department [DSOD] shall make or cause to be made such investigations and shall gather or cause to be gathered such data as may be needed for a proper review and study of the various features of the design and construction of dams, reservoirs, and appurtenances." As authorized under Section 6075 of the CWC, the DSOD, under the State's police power, shall supervise the construction, enlargement, alteration, repair, maintenance, operation, and removal of dams and reservoirs for the protection of life and property.

With regards to those dams and reservoirs in the State that are under the jurisdiction of the DSOD (Section 6076, CWC), it is unlawful to construct, enlarge, repair, alter, remove, maintain, or operate a dam or reservoir except upon approval of the DSOD (Section 6077). Supervision over the maintenance and operation of dams and reservoirs, insofar as necessary to safeguard life and property from injury by reason of the failure thereof, is vested in the DSOD (Section 6100). In determining whether or not a dam or reservoir or proposed dam or reservoir constitutes or would constitute a danger to life or property, the DSOD takes into consideration the possibility that the dam or reservoir might be endangered by seepage, earth movement, or other conditions which exist or which might occur in any area in the vicinity of the dam or reservoir. If the DSOD determines that such conditions exist, the department will notify the owner to take such action as the DSOD determines to be necessary to remove the resultant danger to life and property (Section 6081, CWC).

6.5.4 Uniform Building Code.[37]

The "Uniform Building Code" (UBC) is published by the International Conference of Building Officials (ICBO), now the International Code Council (ICC), one of three model code groups in the country, and is used by most agencies in southern California as the basis for their building codes.[38] The UBC defines

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[36]/ As defined under Section 6002 of the CWC, "'dam' means any artificial barrier, together with appurtenant works, which does or may impound or divert water, and which either (a) is or will be 25 feet or more in height from the natural bed of the stream or watercourse at the downstream toe of the barrier, as determined by the department [DSOD], or from the lowest elevation of the outside limit of the barrier, as determined by the department, if it is not across a stream channel or watercourse, to the maximum possible water storage elevation or (b) has or will have an impounding capacity of 50 acre-feet or more."

[37]/ The California Building Code (CBC) is a modified version of the UBC, which is tailored for California geologic and seismic conditions. It is included in Title 24 of the California Administrative Code and includes stringent earthquake provisions for critical structures.

[38]/ The most effective single element in mitigating earthquake losses to buildings is the consistent application of a modern set of design and construction standards, such as those incorporated in modern building codes. The codes are updated regularly to include the most effective design and construction measures that have been found by testing and research or observed in recent earthquakes to reduce building damage and losses. Local government building departments using a relatively modern code, such as the 1997 UBC, regulate the vast majority of buildings. For new buildings, State and local

criteria to be used in construction of structures based on the level of seismic activity in the region. The ICBO (ICC) has subdivided the United States into six seismic regions. Project sites are located in UBC Seismic Zone 4. As indicated in the UBC, "[t]he building official may require a geotechnical investigation in accordance with Section 1804.2 and 1804.5 when, during the course of investigation, all of the following conditions are discovered, the report shall address the potential for liquefaction: (1) Shallow groundwater, 50 feet (15,240 mm) or less, (2) Unconsolidated sandy alluvium, (3) Seismic Zones 3 and 4."

The ICBO has published maps that are used in conjunction with the 1997 UBC (Tables 16-S and 16-T) for determining engineering factors for new construction in California. In California, the known active surface faults are classified in the 1997 Uniform Building Code as "Class A, "Class B," and "Class C" faults. A "Class A" fault is the most destructive and a "Class C" fault is the least destructive. The slip rate and maximum magnitude of earthquakes associated with a fault are the basis for the categories. Class A faults exhibit magnitudes of 7.0 or greater and slip rates of at least 5 millimeters per year. "Class B" faults fall in the magnitude 6.5 to 7.0 range with slip rates varying depending on maximum magnitude. Only the "Class A" and "Class B" faults are included in the probabilistic maps.

As illustrated in Figure E.6-23 (Class B) encompasses the area of the proposed Santa Rosa Substation, Powerhouse, and certain associated Project facilities. The near-source zones have been mapped considering the dip angle of the faults in accordance with the 1997 UBC (Footnote 3 of Tables 16-S and 16-T).

governments enforce the California Building Standards Code (CBSC) that includes earthquake safety provisions from the 1997 UBC with enhancements for hospitals, public schools, and essential services buildings (Source: Governor's Office of Emergency Services, State of California Multi-Hazard Mitigation Plan, September 2004, p. 80).

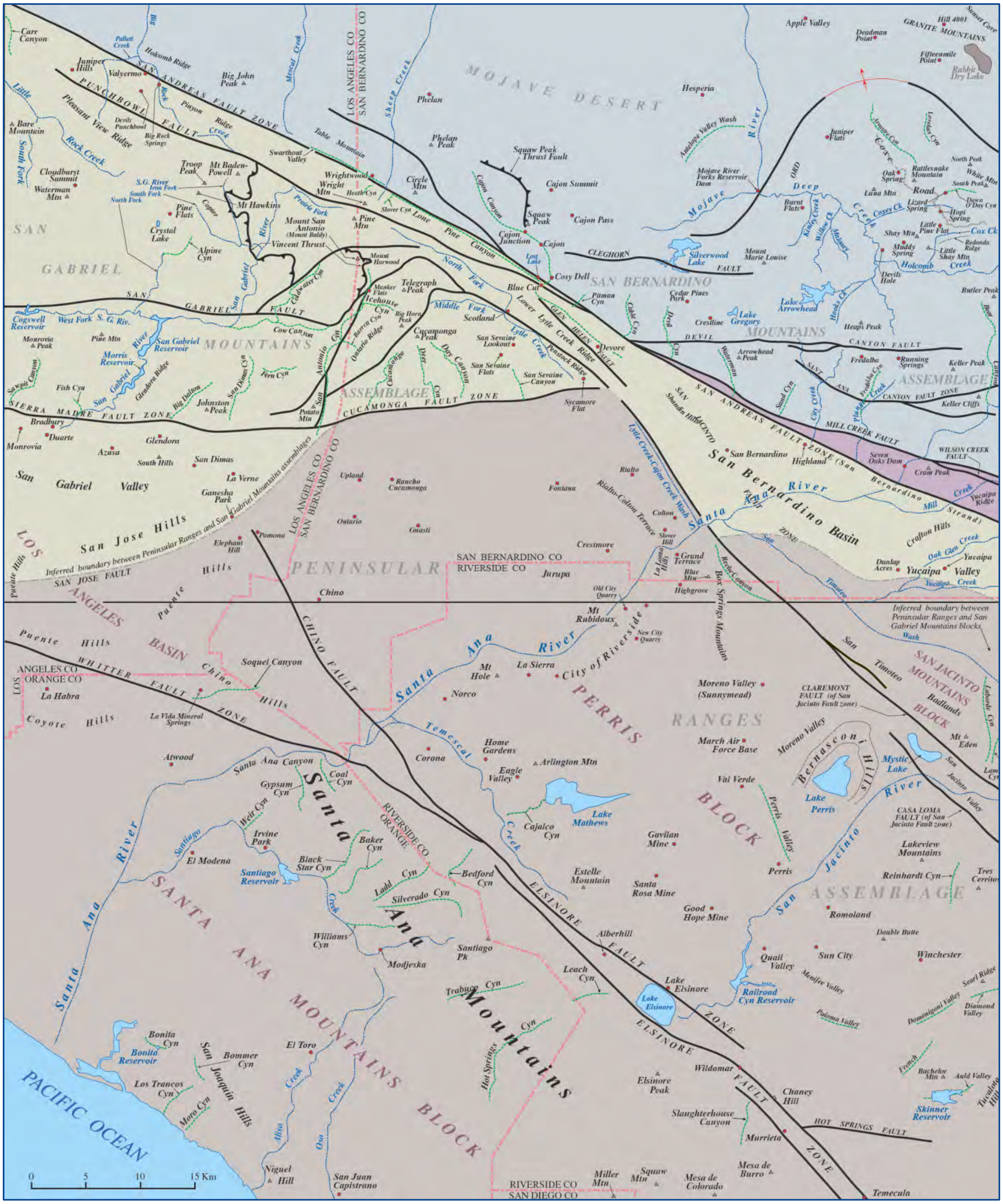


Figure E.6-1: Physiographic Provinces of Southern California
Source: United States Geological Survey

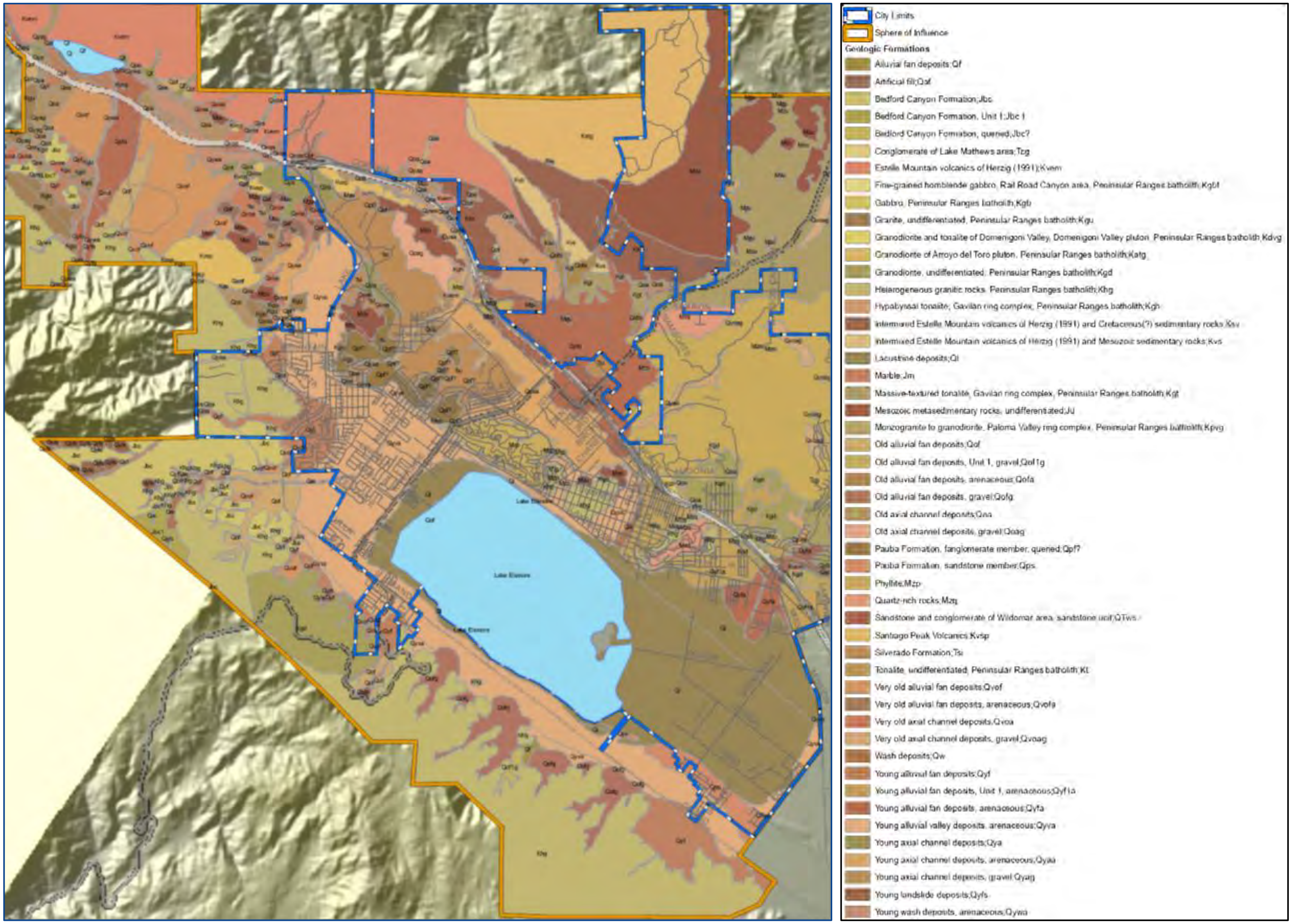


Figure E.6-2: City of Lake Elsinore Geologic Formations
Source: City of Lake Elsinore

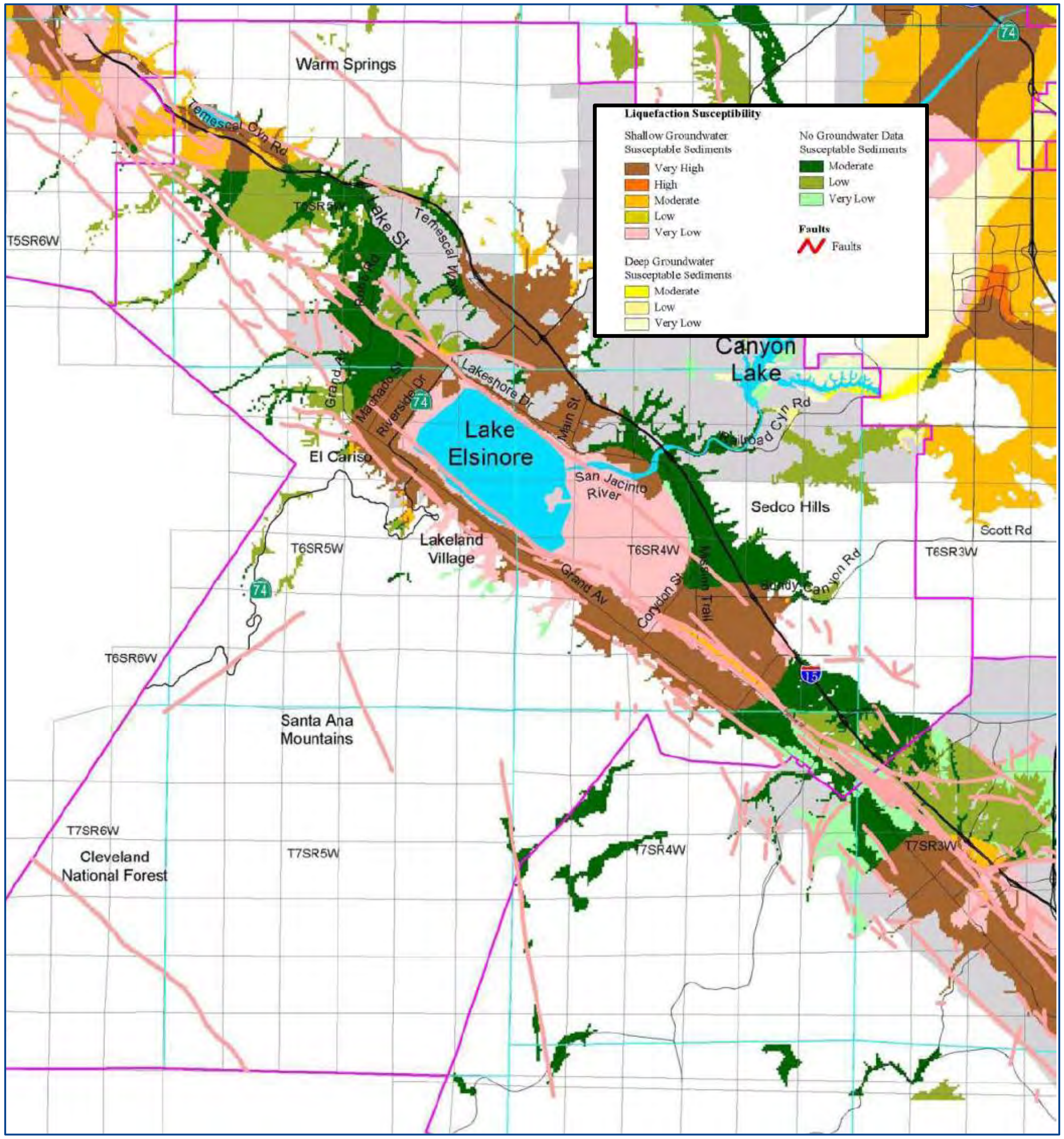


Figure E.6-3: Seismic Hazards

Source: City of Lake Elsinore

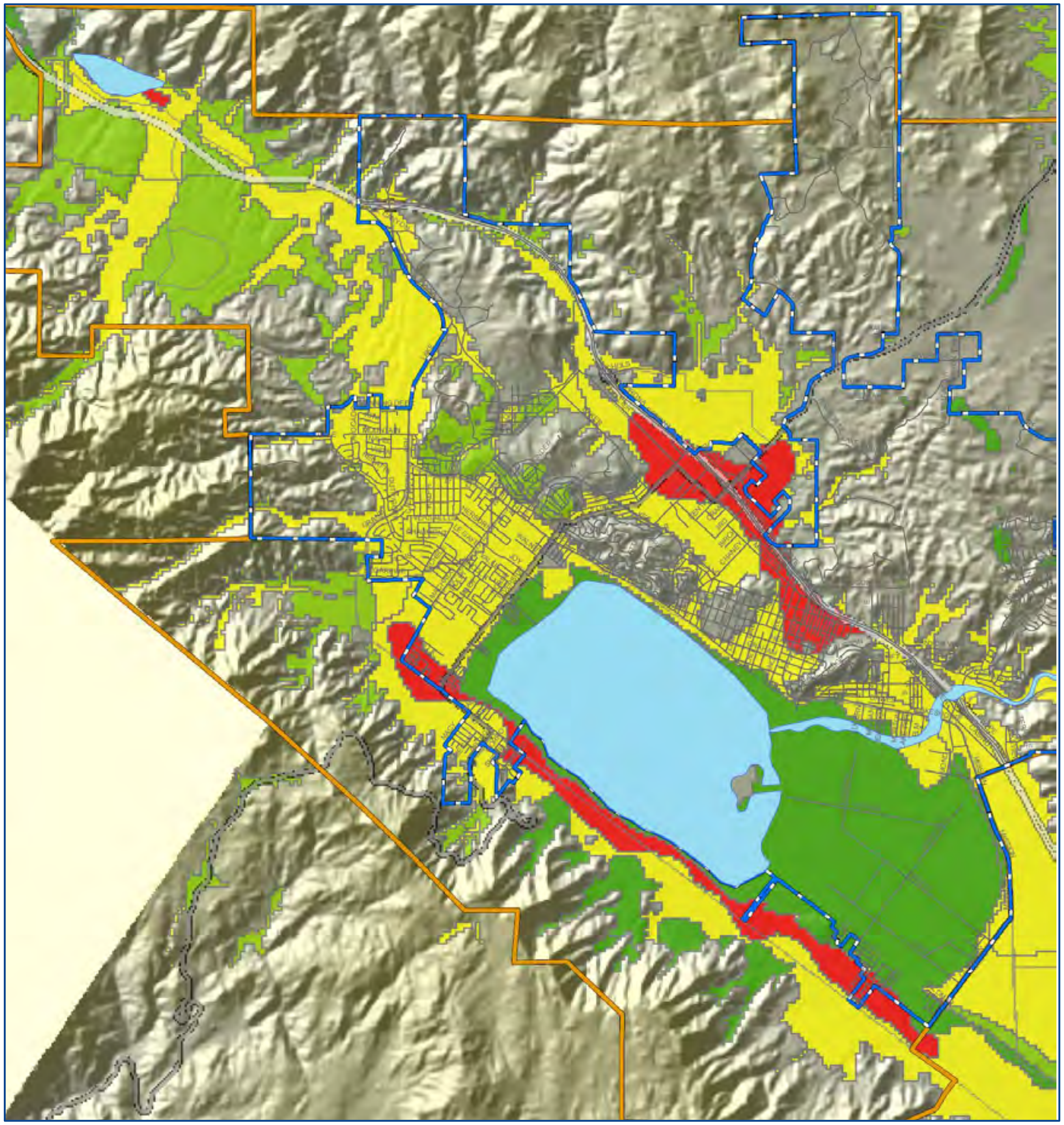


Figure E.6-4: Liquefaction Susceptibility in the Lake Elsinore Area
Source: City of Lake Elsinore

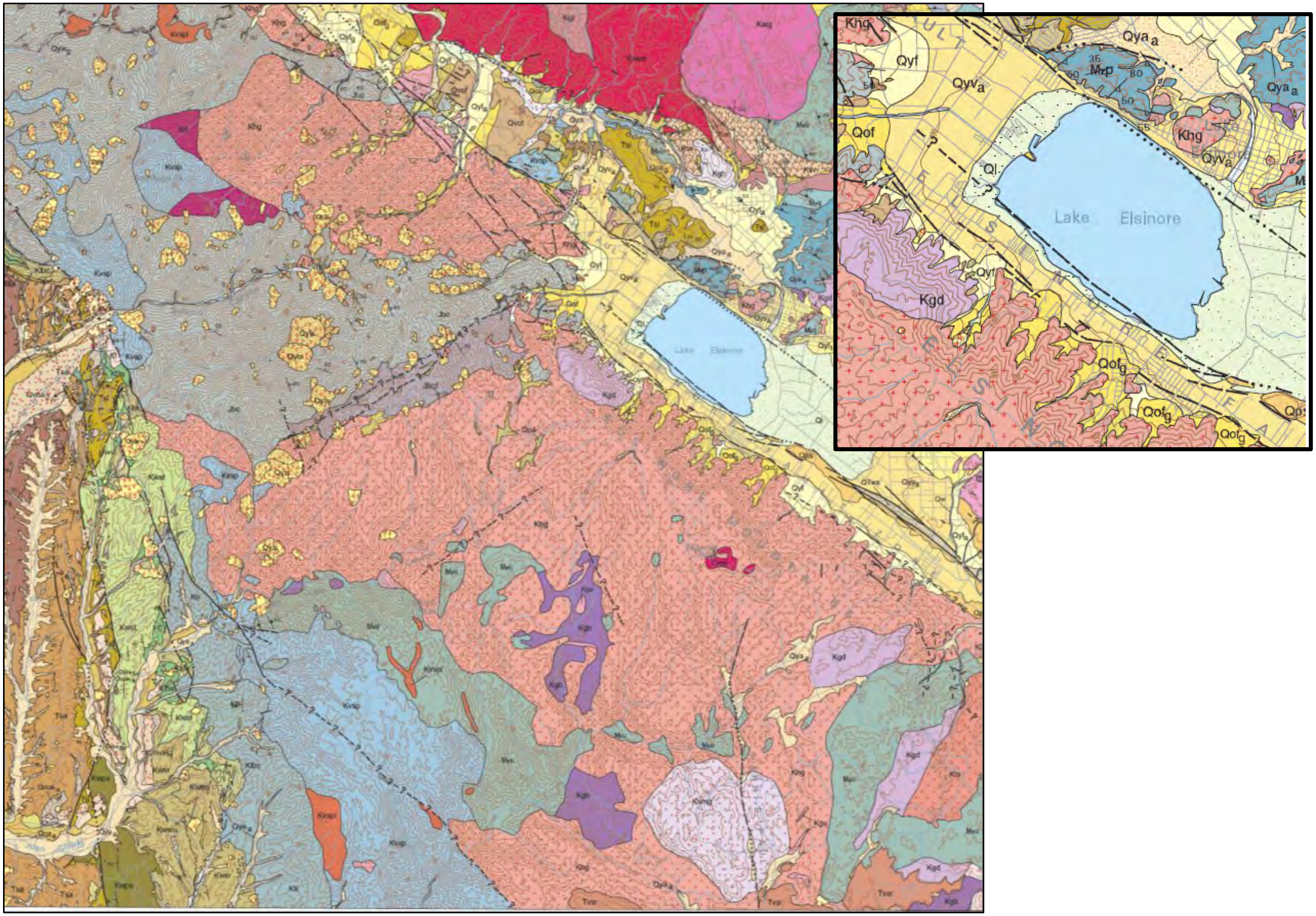


Figure E.6-5: Preliminary Geologic Map Santa Ana 30' x 60' USGS Quadrangle (1999)

Source: United States Geological Survey

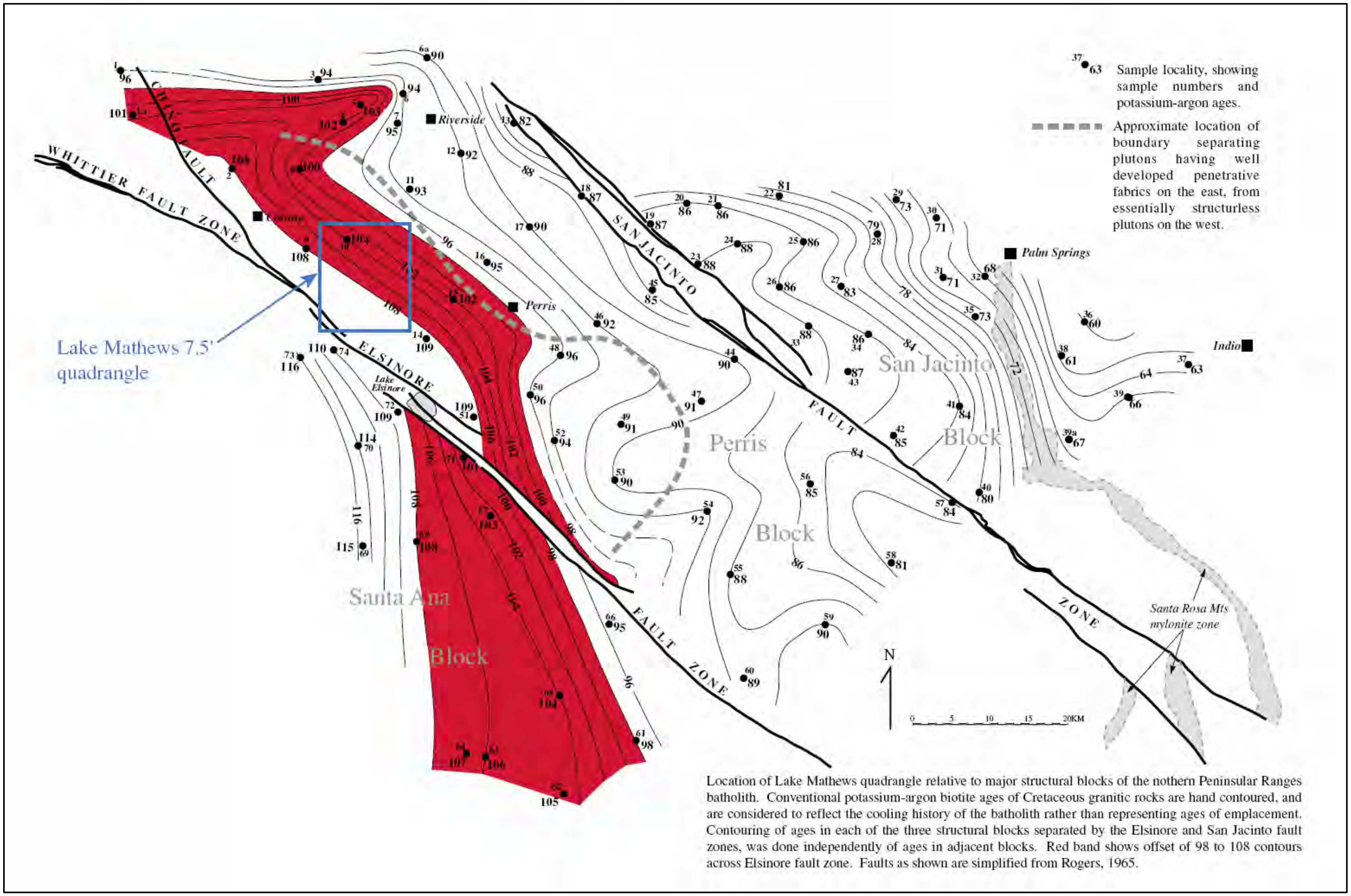


Figure E.6-6: Major Structural Blocks of the Northern Peninsular Ranges Batholith
Source: United States Geological Survey

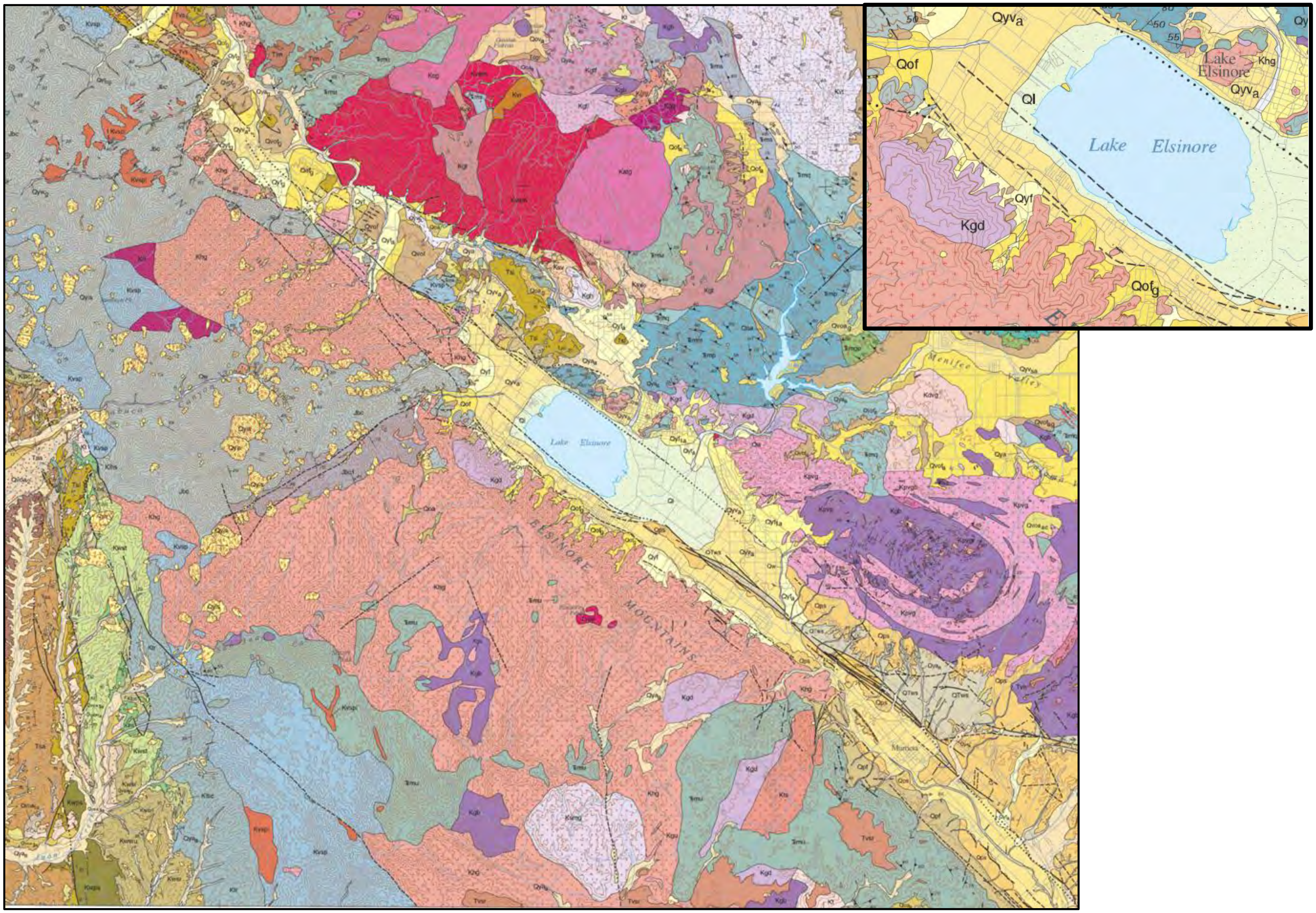


Figure E.6-7: Geologic Map San Bernardino and Santa Ana 30 x 60-Minute Quadrangles
Source: United States Geological Survey

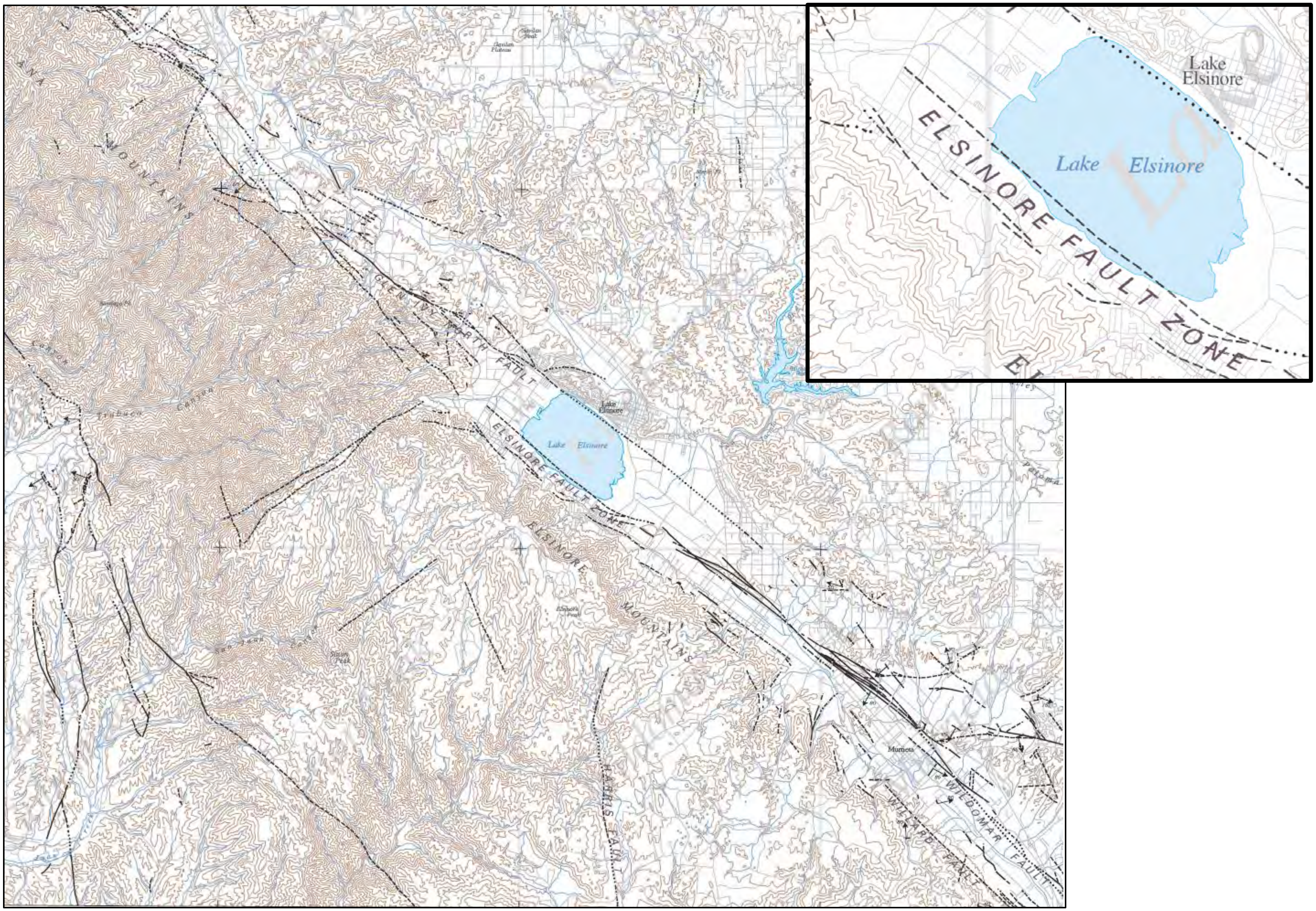


Figure E.6-8: Major Earthquake Faults
Source: United States Geological Survey

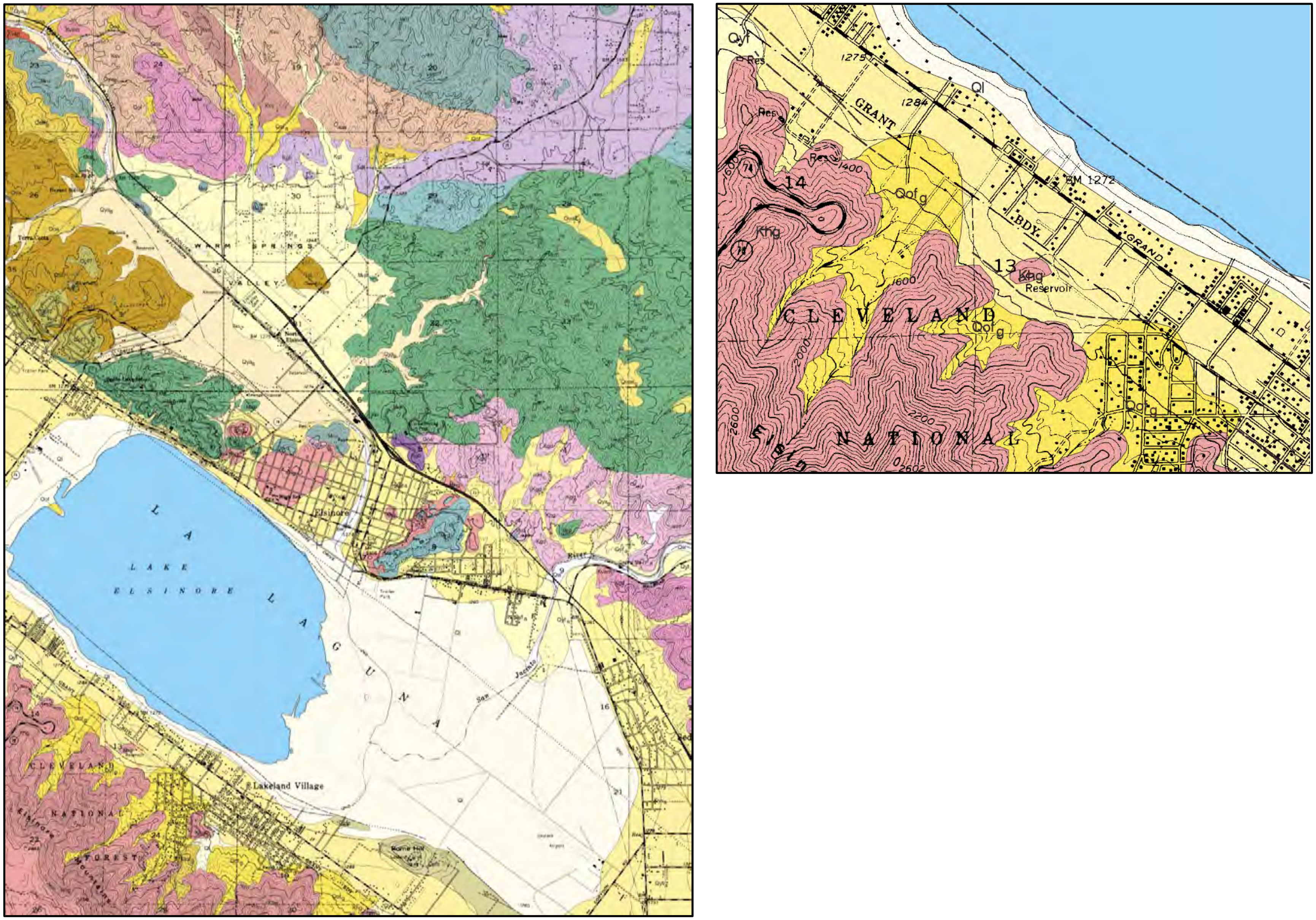
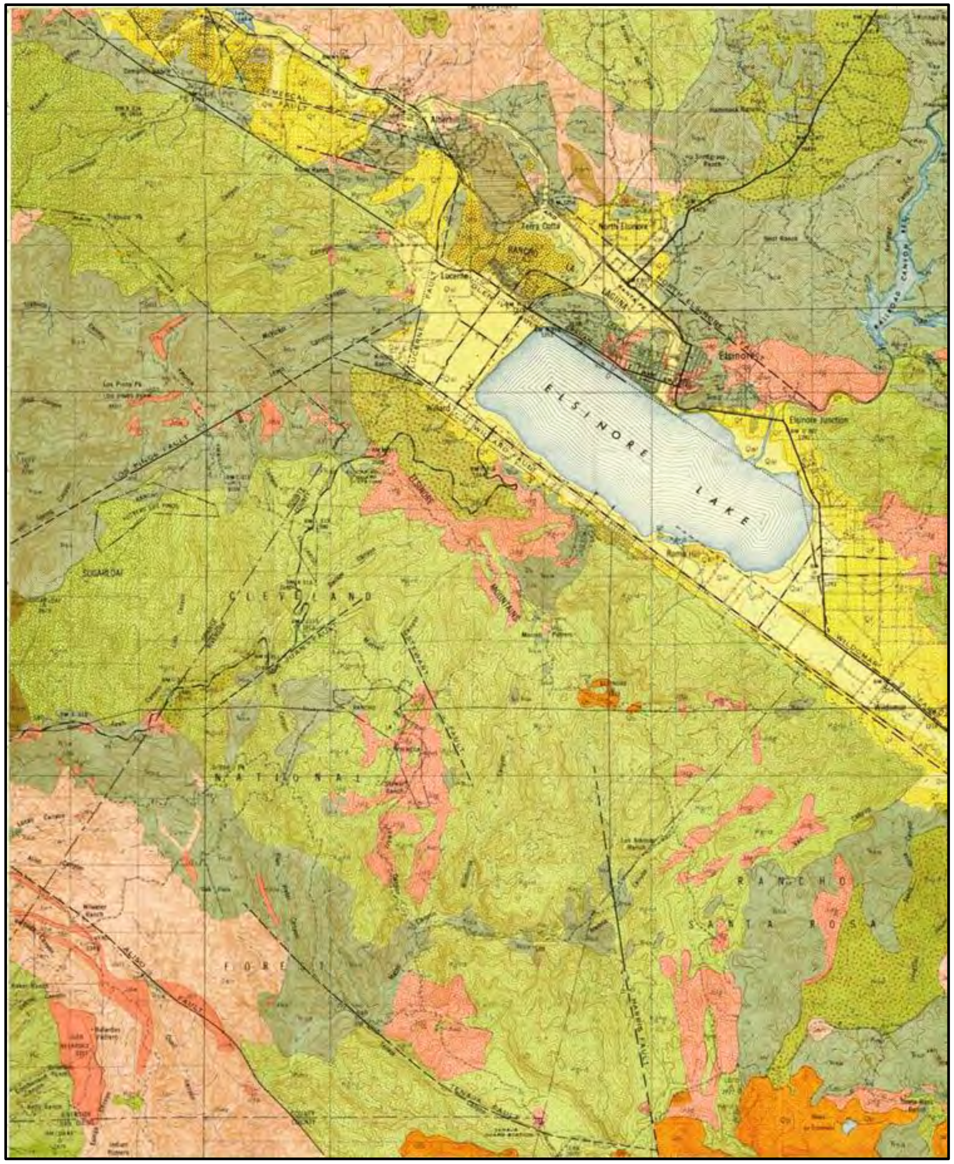
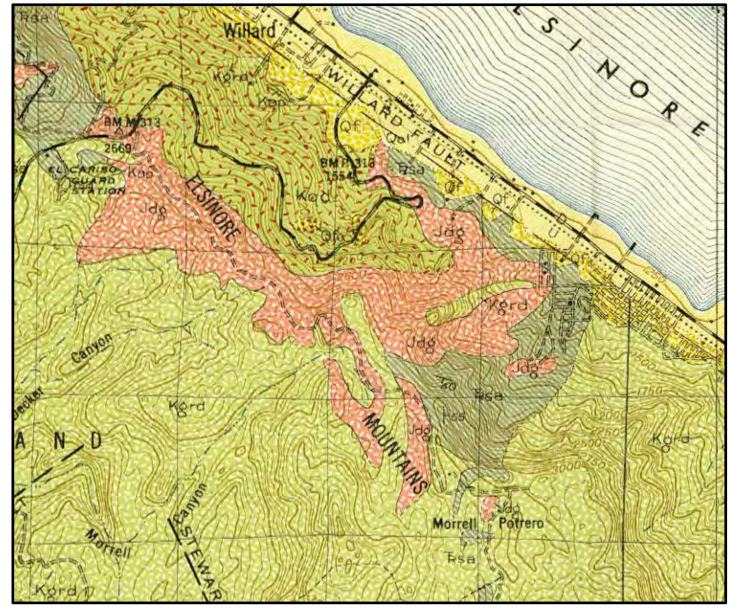


Figure E.6-9: Geologic Map Elsinore 7.5-Minute Quadrangle
Source: United States Geological Survey





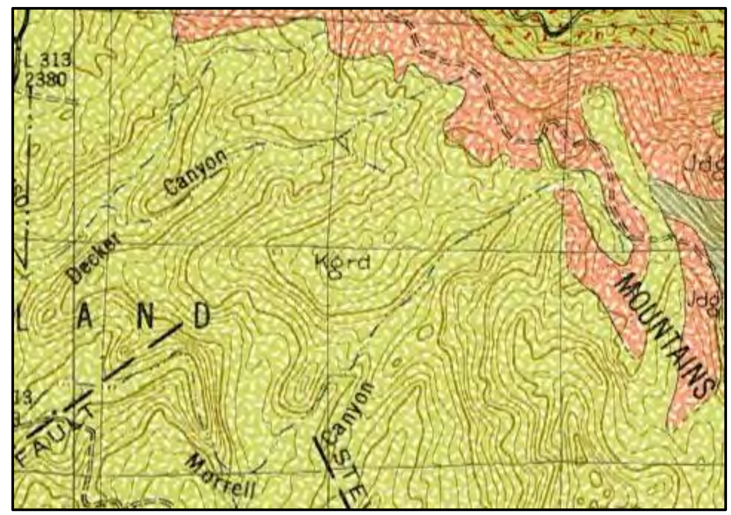


Figure E.6-10:Geologic Map Elsinore 15-Minute Quadrangle (1959)
Source: United States Geological Survey

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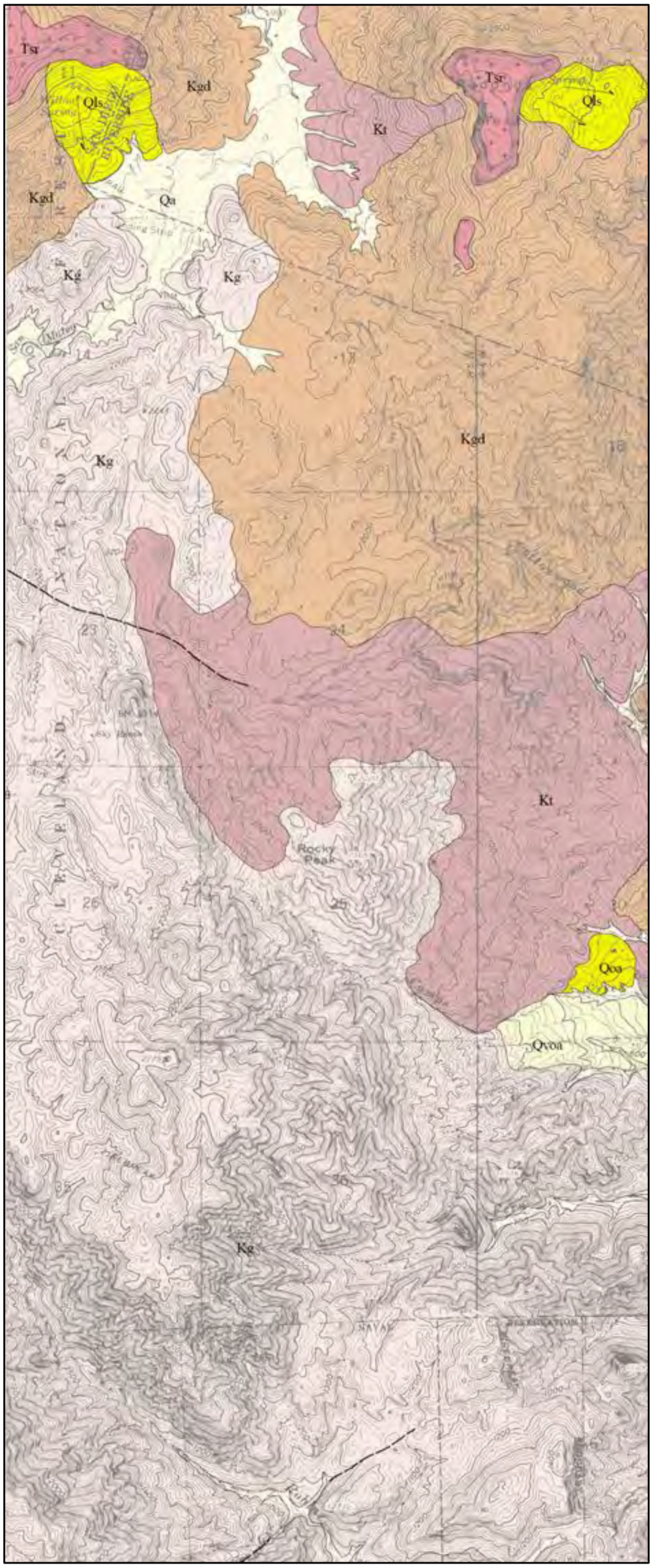

Figure E.6-11:Geologic Map Fallbrook 7.5-Minute Quadrangle (1 of 2)
Source: United States Geological Survey (2000)

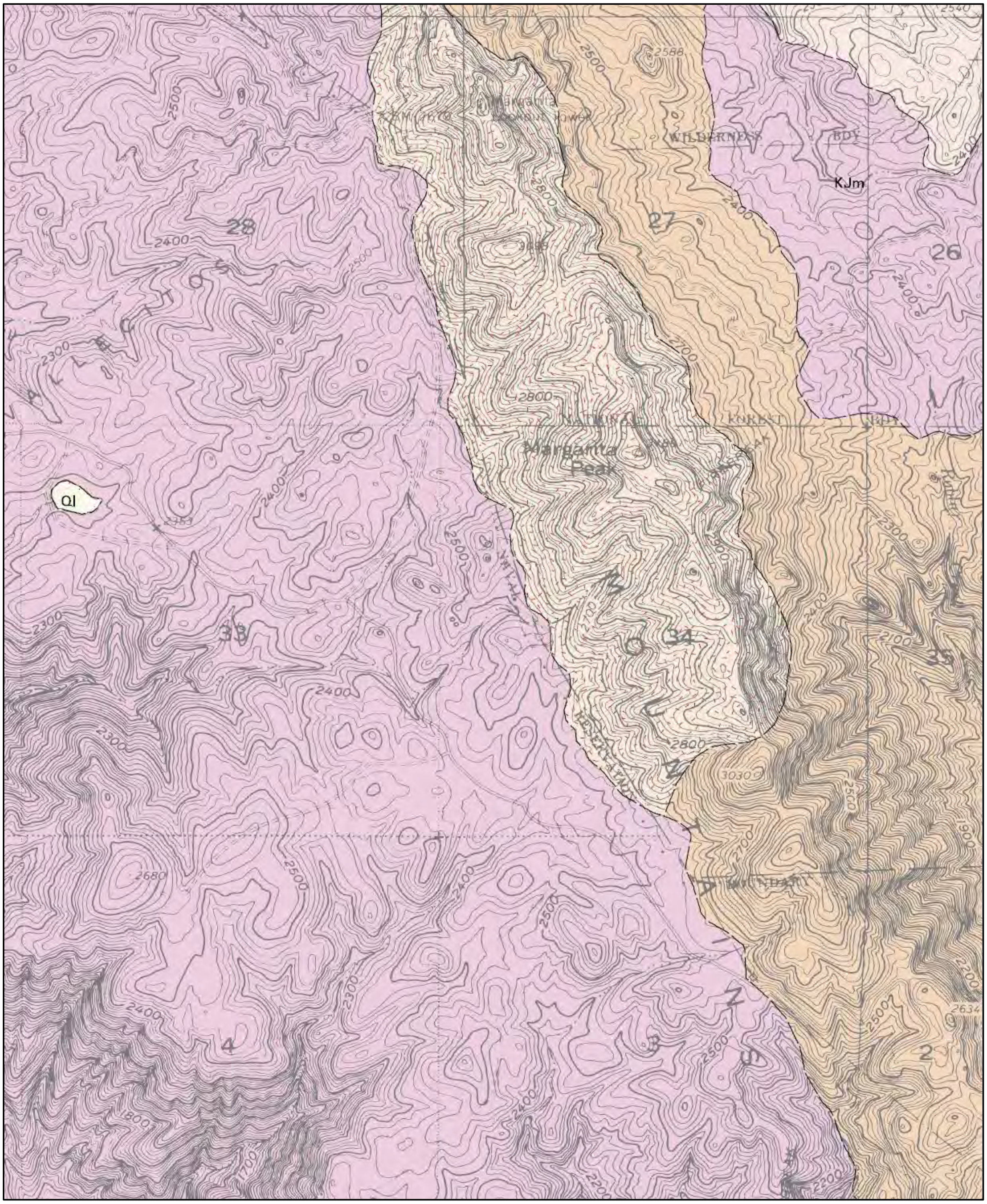

Figure E.6-12:Geologic Map Margarita Peak 7.5-Minute Quadrangle (2 of 2)
Source: United States Geological Survey

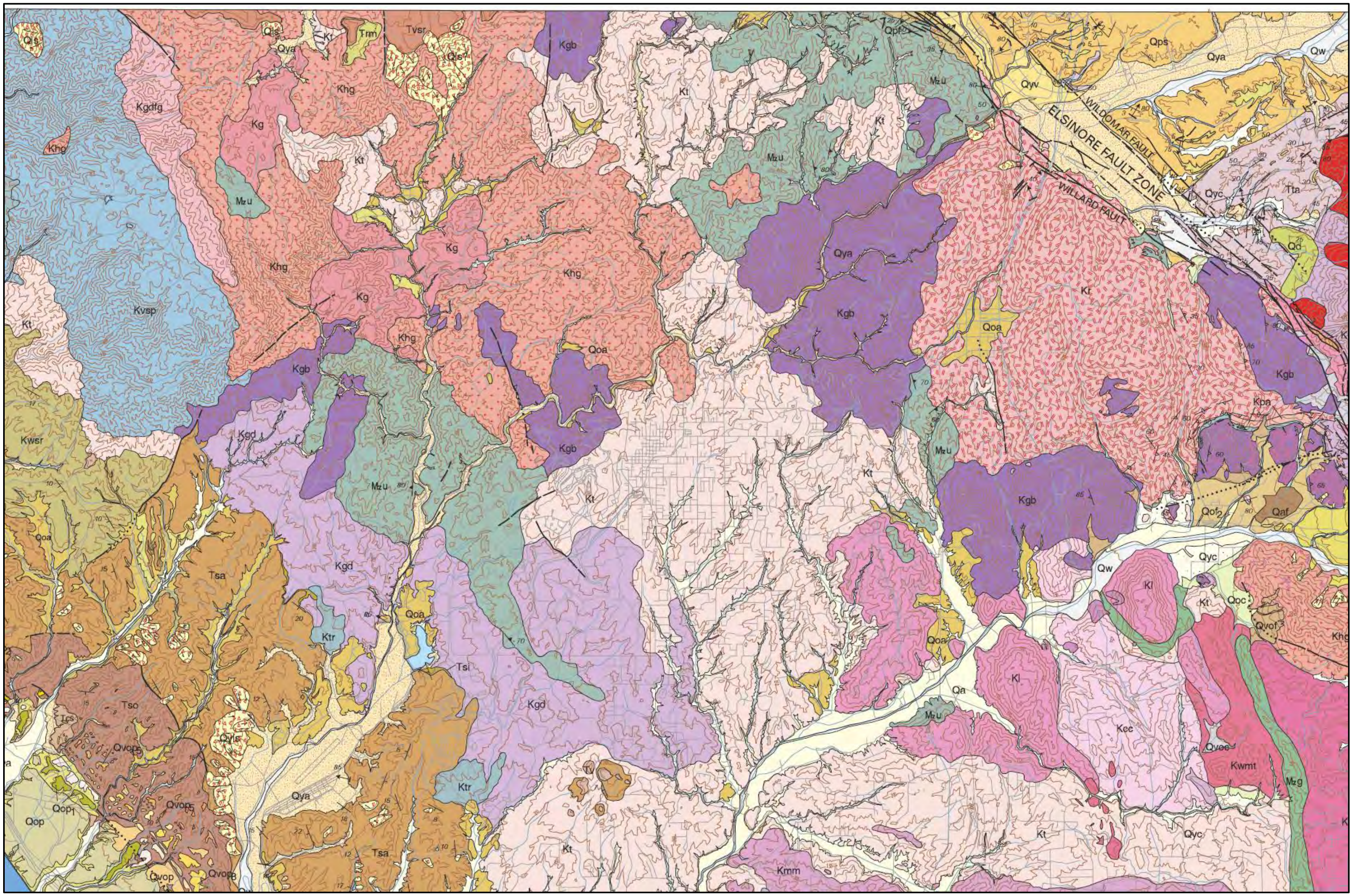

Figure E.6-13:Geologic Map Oceanside 30x60-Minute Quadrangle
Source: United States Geological Survey

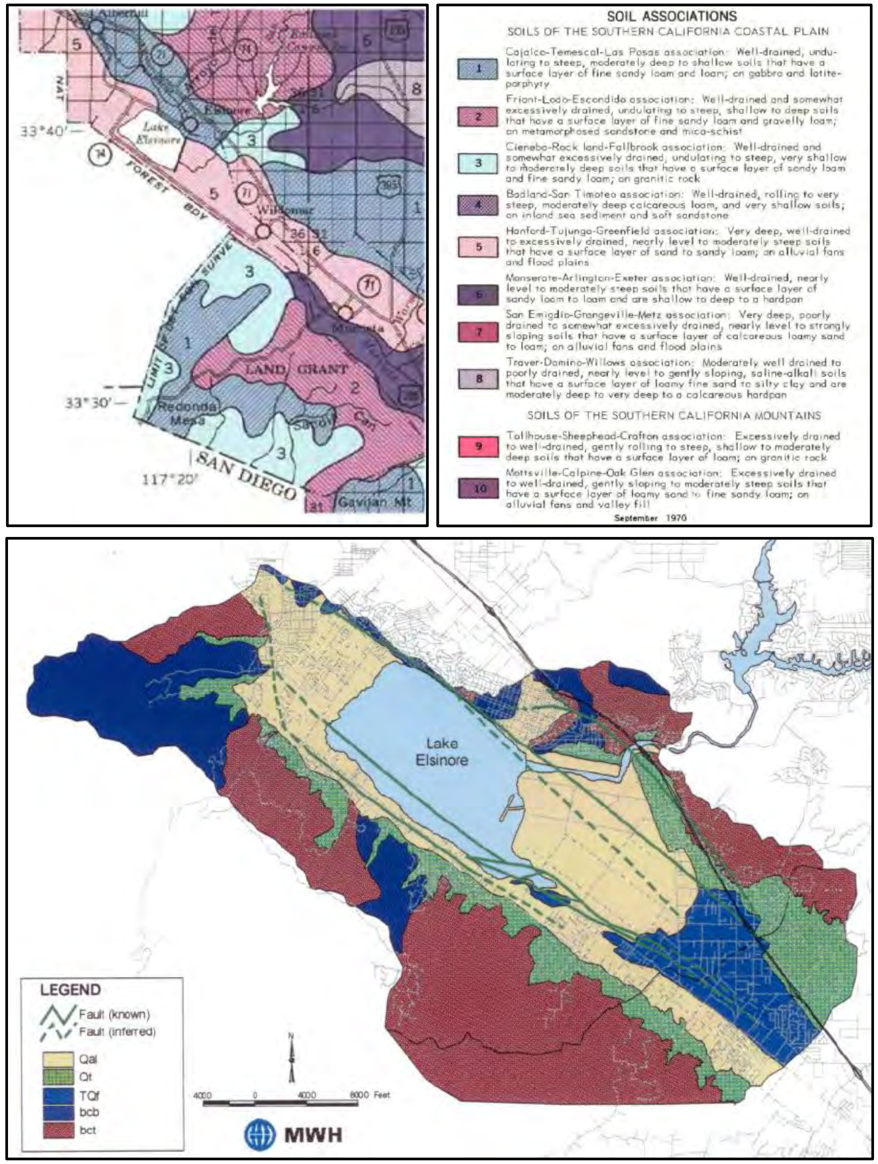

Figure E.6-14:General Soil Map Western Riverside County (1 of 2)
Source: United States Department of Agriculture

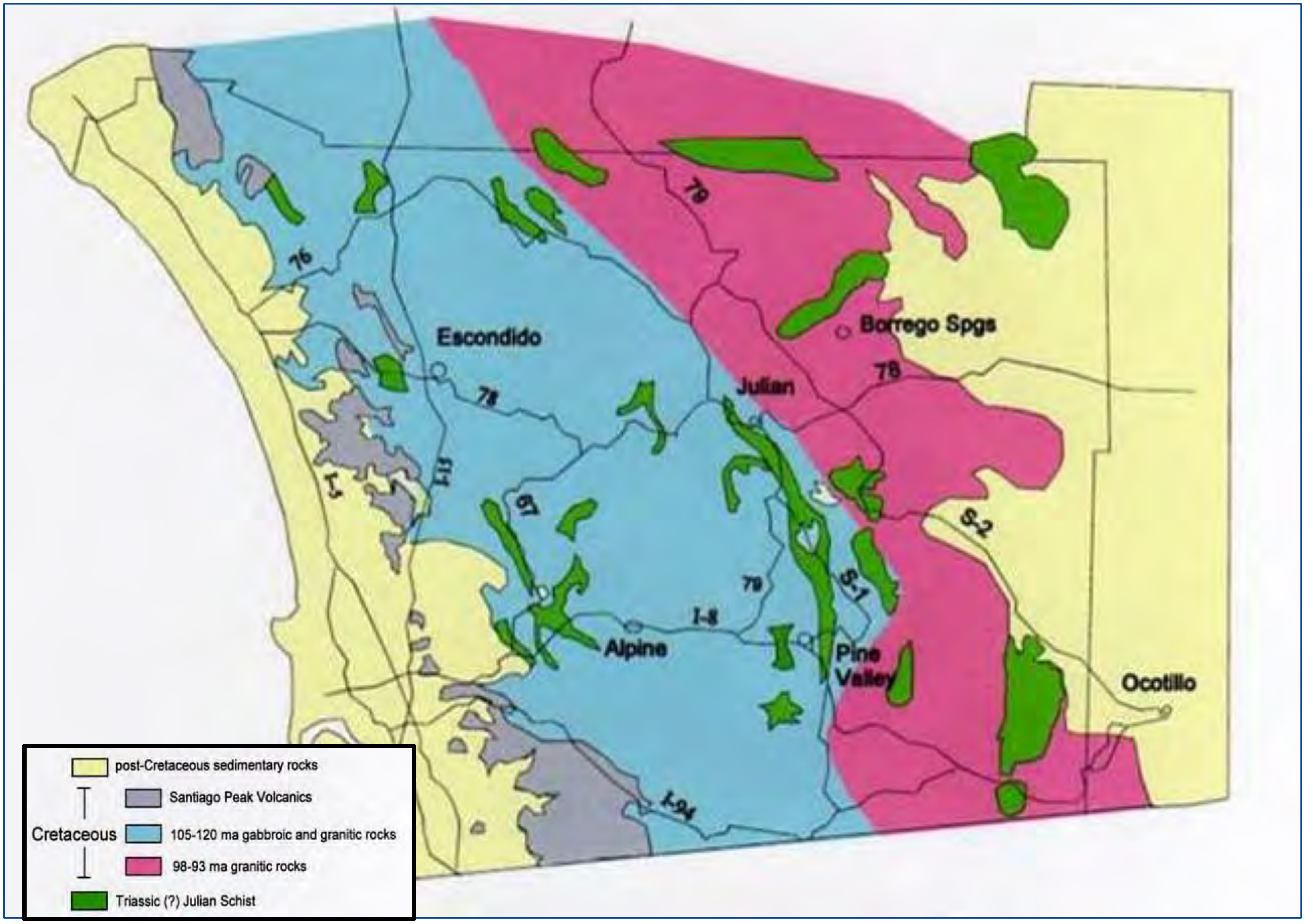

Figure E.6-15: General Soil Map Northern San Diego County (2 of 2)
Source: United States Department of Agriculture

Figure E.6-16:Soil Survey Map – Upper Reservoir Sites
Source: Soil Conservation Service

Figure E.6-17:Soil Survey Map – Santa Rosa Substation and Powerhouse Sites
Source: Soil Conservation Service (1971)

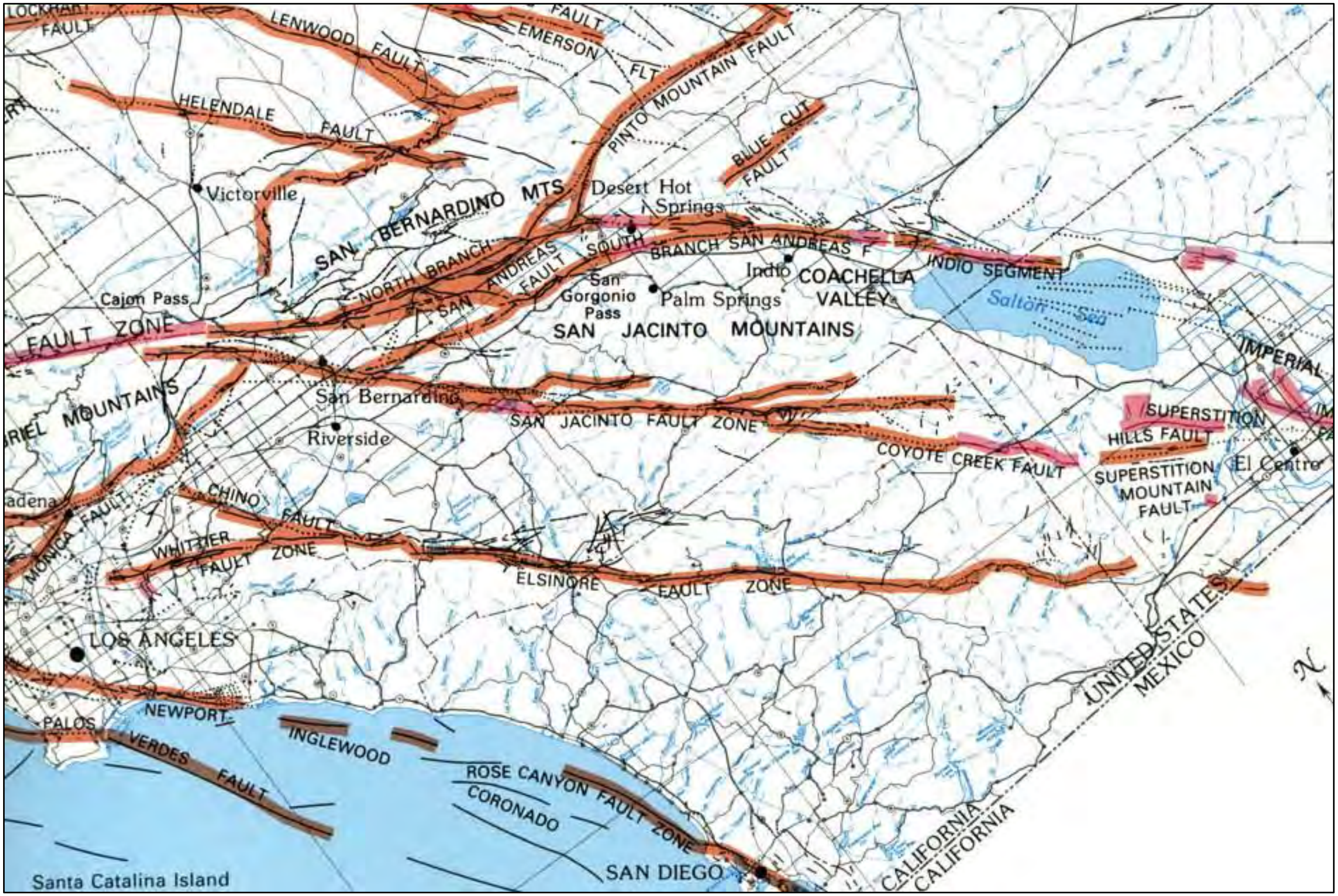

Figure E.6-18:Portion of Fault Map of California
Source: California Division of Mines and Geology

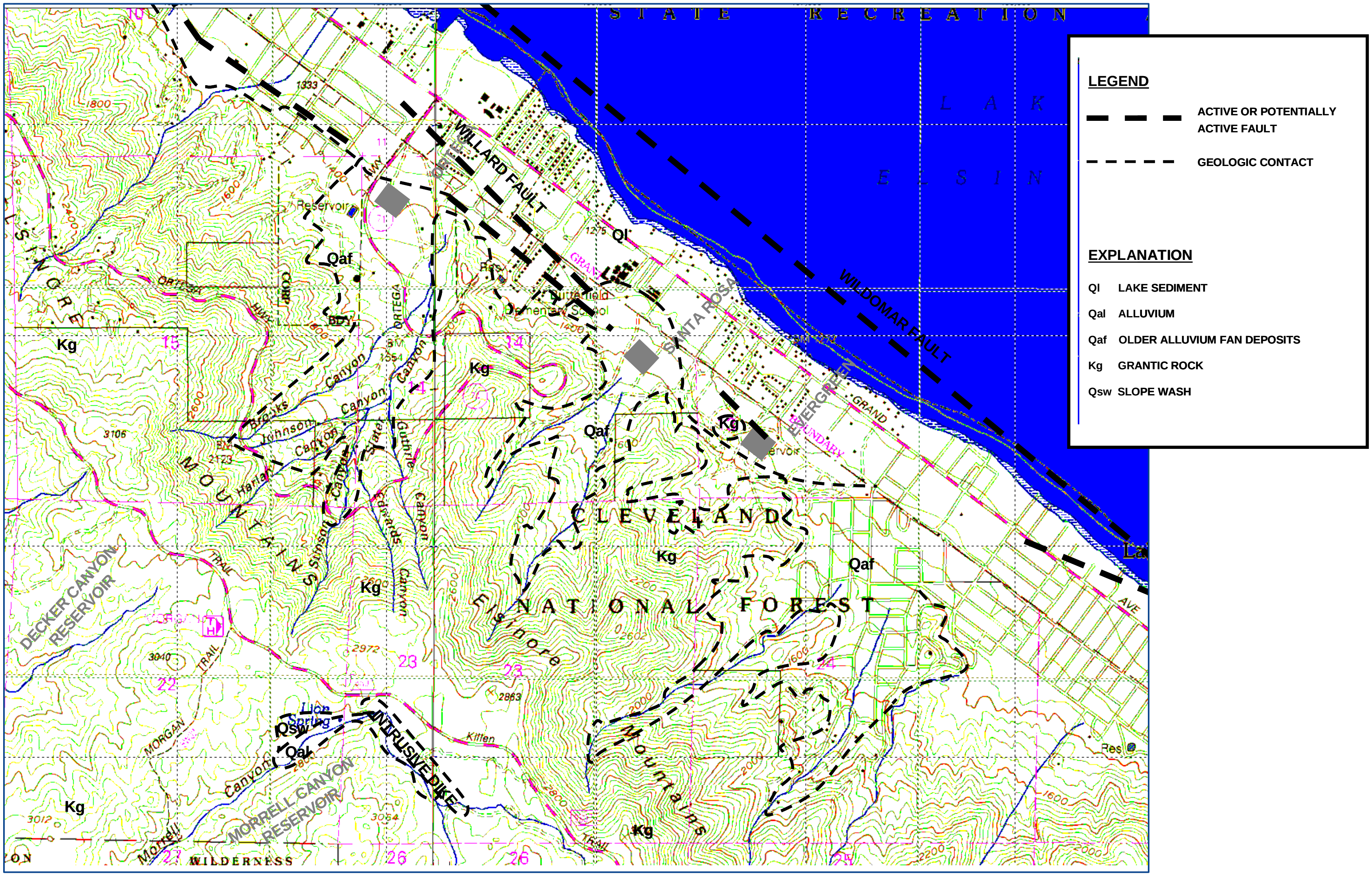

Figure E.6-19:Willard and Wildomar Faults

Source: GENTERRA Consultants, Inc.

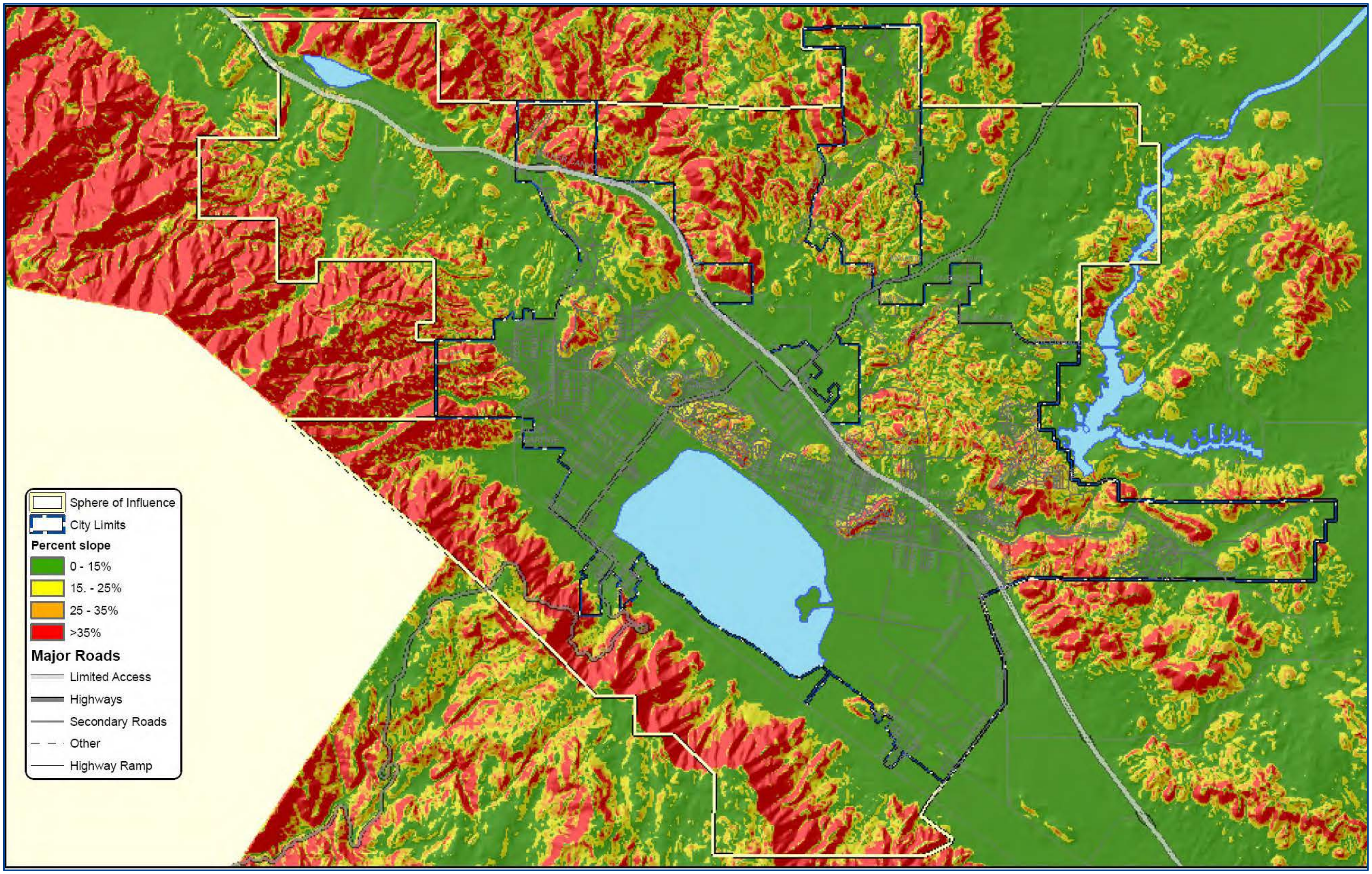

Figure E.6-20:Percent Slope Map
Source: City of Lake Elsinore

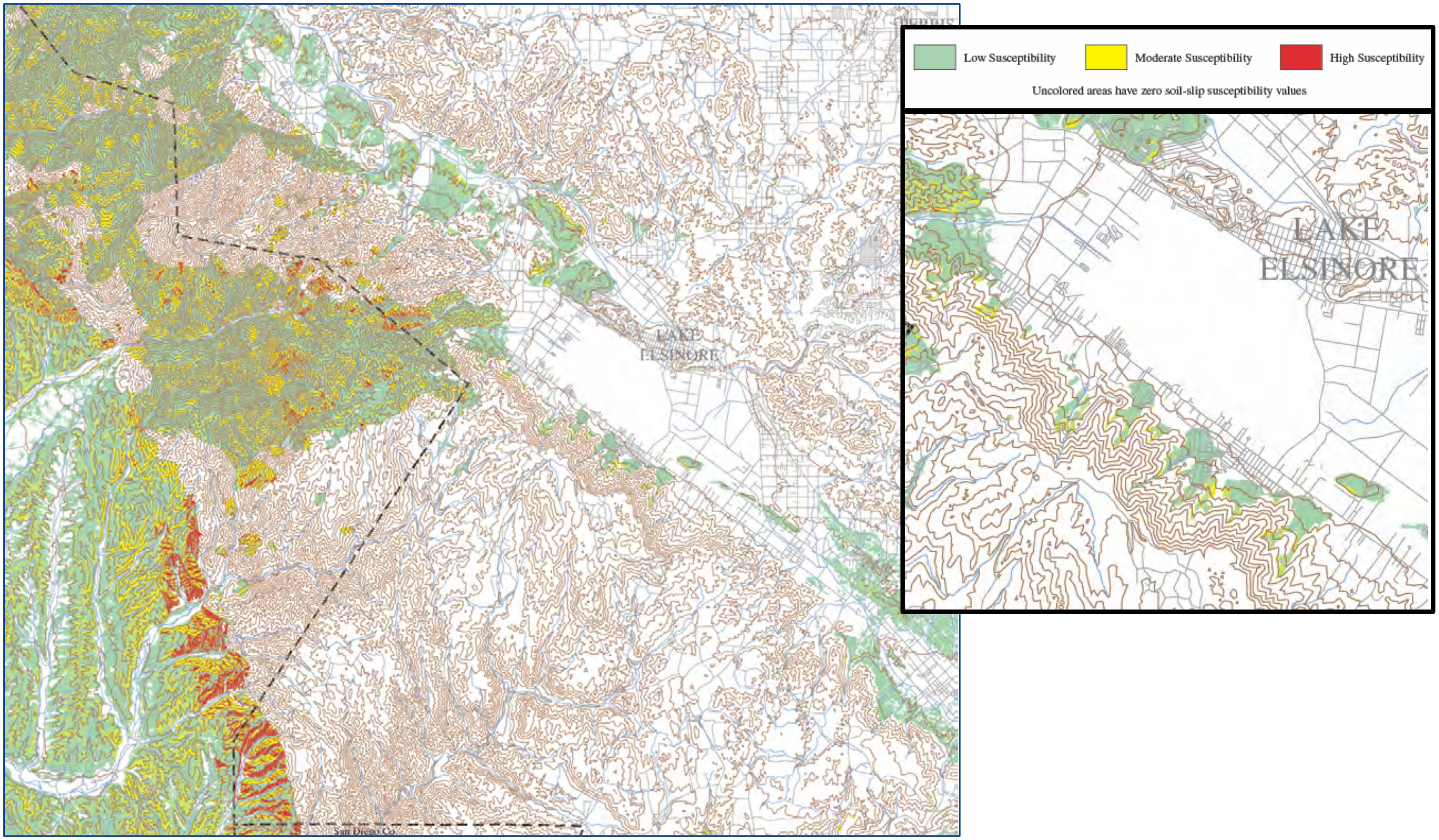

Figure E.6-21:Soil-Slip Susceptibility Map Santa Ana 30'x 60' Quadrangle
Source: California Geological Survey

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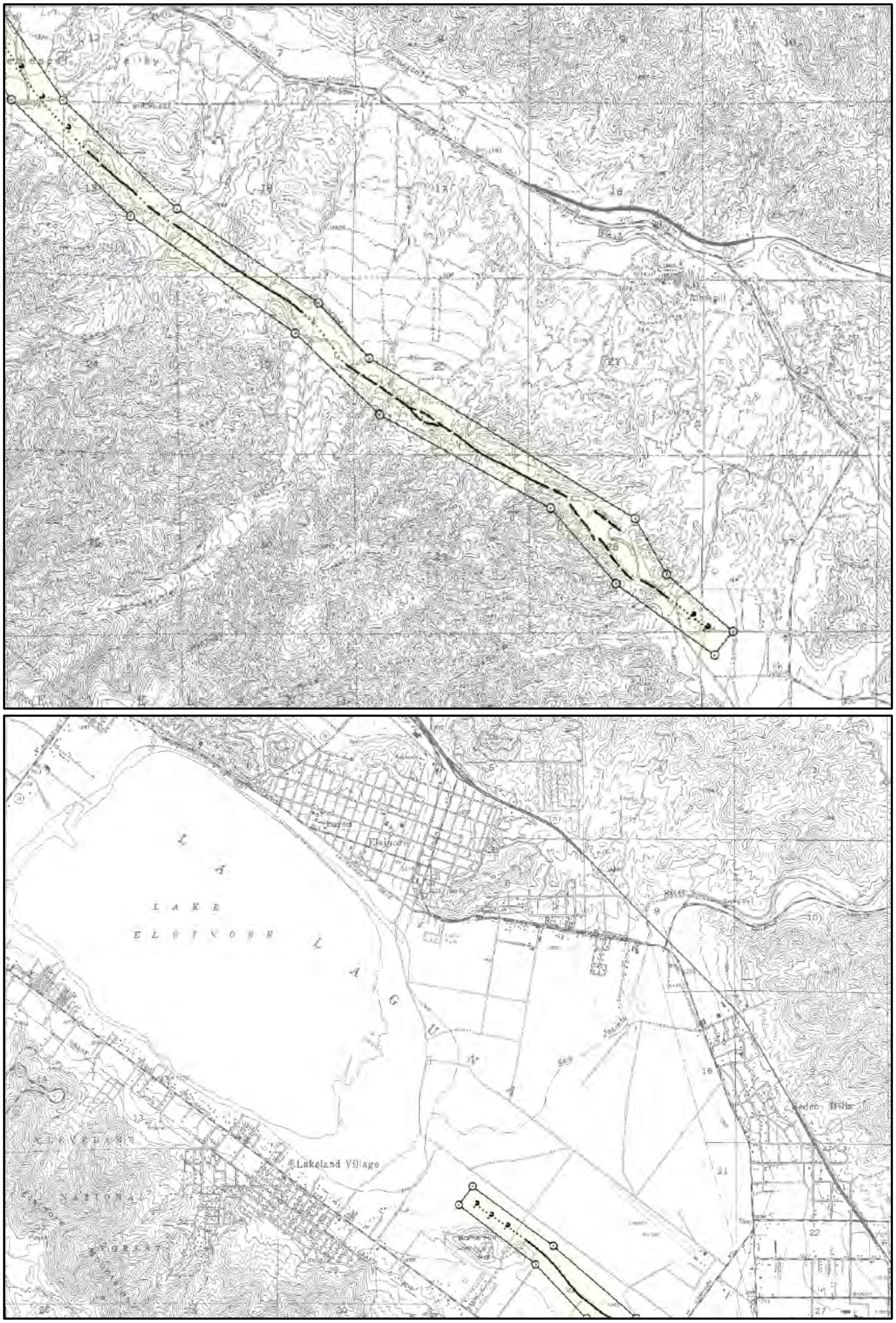

Figure E.6-22:Earthquake Fault Zones - Alberhill Quadrangle
Source: California Department of Conservation

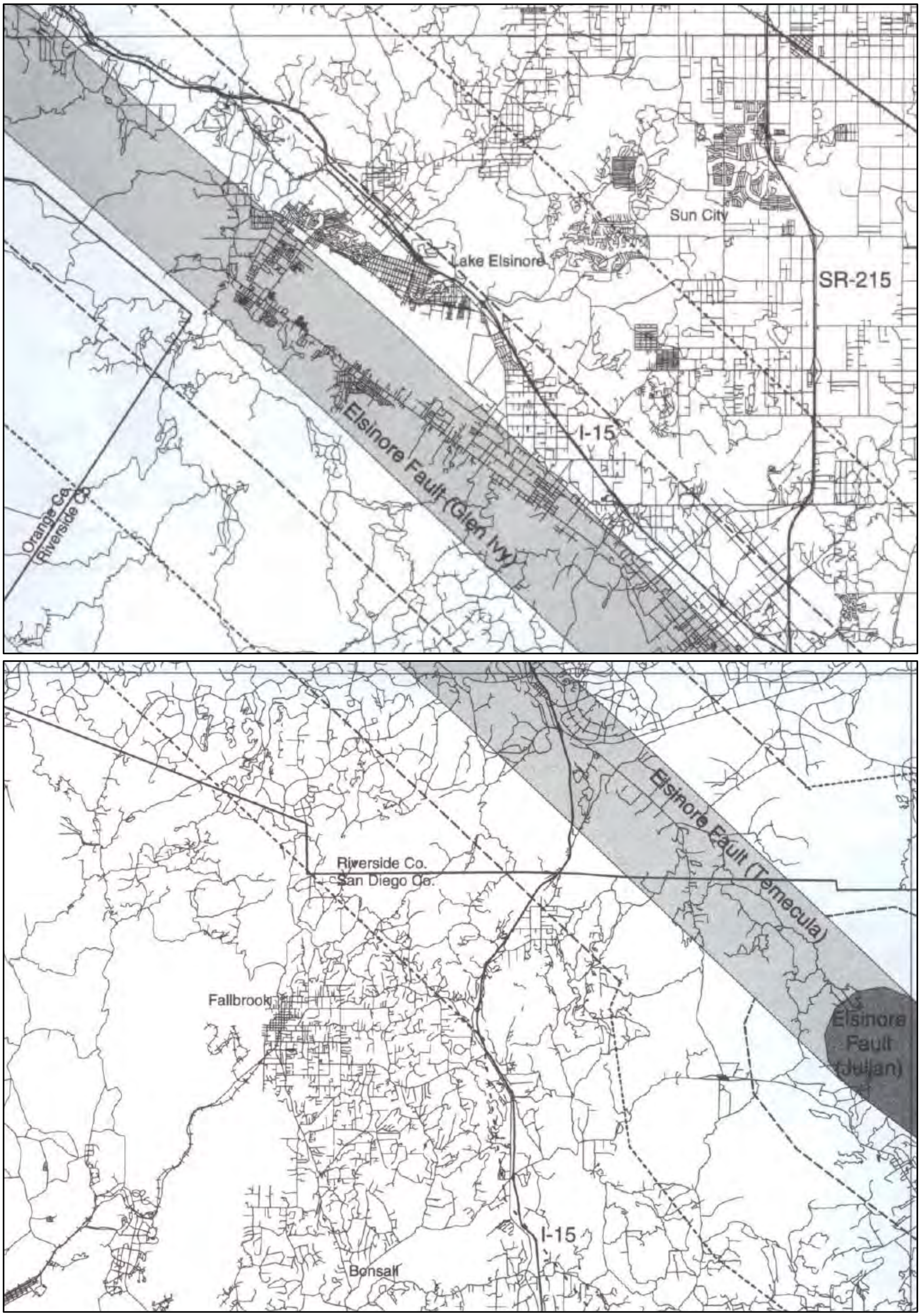

Figure E.6-23:Elsinore Fault (Glen Ivy &Temecula)
Source: International Conference of Building Officials

6.6 Impacts on geology, soils, and seismicity

6.6.1 Potential Impacts of Generation Facilities

A portion of the proposed generation facilities would be located within the San Jacinto River Basin with other associated structures located in the adjacent San Juan Creek watersheds. The San Jacinto River Basin is located in southern California, about 20 miles inland from the Pacific Ocean and covers more than 780 square miles of widely varying terrain. The river basin is bounded by north-south mountains: the Santa Ana Mountains (including the Elsinore Mountains, Santa Margarita, and the Santa Rosa Plateau) to the west and the more distant San Jacinto Mountains to the east (FERC FEIS, 2007). The generation facilities span the boundary between two geologic environments - an actively subsiding fault-bounded basin containing Lake Elsinore and a more stable mountain block underlain by minor metamorphic rocks and undivided granitic rocks of the Peninsular Ranges Batholith. Both geologic environments are a part of the Peninsular Ranges Geomorphic Province of Southern California (FERC FEIS, 2007).

The Elsinore Basin is located in the southeast part of the Los Angeles Basin. The Los Angeles Basin is a region of alluvial outwash, encompassing most of Los Angeles and Orange Counties, as well as western Riverside and San Bernardino Counties. The Los Angeles Basin is considered part of the Peninsular Ranges Geomorphic Province of Southern California, characterized by elongated ranges and fault-formed and alluvial valleys with a general northwesterly trend. The Elsinore Basin is a down-faulted (trough) about eight miles long and between two and three miles wide. The long axis of the valley parallels the northwesterly regional structural trend, and rugged hills and mountains border the basin on all but the southeastern side. The lowest portion of the basin floor is a broad, relatively flat area known as “La Laguna,” which is partially occupied by Lake Elsinore. La Laguna forms the terminus for the San Jacinto River, which flows into the Elsinore Basin from the northeast. To the southwest are the steep slopes of the Elsinore Mountains. The northeastern edge of the basin is bordered by the Sedco and Cleveland Hills, part of the Temescal Mountains. The Elsinore fault parallels the base of the Cleveland Hills and marks the structural edge of the basin in this area; the Elsinore fault continues northwest at the base of the Santa Ana Mountains and is the principle segment of the Elsinore fault zone north of Lake Elsinore. The southeastern end of the basin is formed by a low alluvial divide built up by streams draining the Elsinore Mountains (FERC FEIS, 2007).

The geology of the Elsinore Basin comprises essentially three major units. At the surface lies alluvium from a variety of sources. Underneath the surface alluvium is the sedimentary Pauba Formation, and under that lies the “basement rocks” of the Peninsular Ranges Batholith. The alluvial formation covers the lower portions of the valley and can be divided into alluvial fan deposits, floodplain deposits, and recent lacustrine deposits. Lake Elsinore, which is a structural depression formed within a graben along the Elsinore fault, is surrounded by a combination of predominantly igneous and metamorphic rocks. Lake Elsinore is constrained along its southern edge by the steep, deeply incised Elsinore Mountains. The Elsinore Mountains provide a local sediment source. Total sediment thickness underlying Lake Elsinore is estimated to be more than 3,000 feet. Two exploratory wells drilled at the east end of the lake to 1,780 feet and 1,800 feet encountered unconsolidated sediment described as mostly fine grained.

The Elsinore Mountains are a portion of the Santa Ana Mountain Range, which form the northernmost range of the Peninsular Ranges Geomorphic Province. The Peninsular Ranges Province is characterized by a northwest-striking structural fabric (faulting and folding) influenced by the San Andreas fault system. The northern Peninsular Ranges Province is divided (in terms of physiography) into three major fault-bounded blocks: the Santa Ana, Perris, and San Jacinto. The westernmost of the three, the Santa Ana block, extends eastward from the coast to the Elsinore fault zone. Tertiary sedimentary rocks (Paleocene through Pliocene in age) lie under the western foothills portion of the Santa Ana block, and further east the highly faulted Santa Ana Mountains are comprised of a basement assemblage of Mesozoic metasedimentary and Cretaceous volcanic and batholitic rocks, which is overlain by a thick section of primarily upper Cretaceous marine rocks and Paleocene marine and non-marine rocks. The southern part of the Santa Ana Mountains opens into an expansive, nearly horizontal erosion surface that is partly covered with Miocene basalt flows (FERC FEIS, 2007).

The high-head conduit and upper reservoir would be constructed within the Santa Ana (Elsinore) Mountains. The proposed Decker Canyon Reservoir is located in the headwaters of San Juan Creek. San Juan Creek flows west toward the Pacific Ocean and is separate from the drainages on the east flank of the Santa Ana (Elsinore) Mountains. Because the proposed Decker Canyon Reservoir site would be located at the top of the watershed, no stream bypass system would be required.

The proposed Decker Canyon Reservoir site is bounded by Morgan Hill on the south, a ridge to the north, and South Main Divide Road to the east. The rugged, mountainous terrain of the Santa Ana Mountains is characteristic of the reservoir site. The geologic units at Decker Canyon are comprised of granitic bedrock, alluvium, and slopewash. The bedrock is typically light gray, medium-to coarse-grained, and moderately fractured. Weathering of the granitic rock is variable near the surface. Surface alluvium and thick accumulations of slopewash are largely absent. The erosion gullies into the side slopes and base of Decker Canyon show only a minor amount (less than 2 inches) of soil development overlying intact bedrock. No evidence of groundwater near the surface was noted during geologic reconnaissance (FERC FEIS, 2007).

The proposed penstock connecting the Decker Canyon Reservoir and the Powerhouse would run through the eastern edge of the Santa Ana (Elsinore) Mountains. It is expected that the penstock would be excavated into granitic bedrock similar to that described for the upper reservoir. Because of the nature of such large expanses of bedrock and the characteristics of the Santa Ana (Elsinore) Mountains, faults, joints, fractures, and groundwater probably would be encountered during excavation of the penstock and tunnel system (FERC FEIS, 2007).

The proposed tailrace tunnel extends from the proposed powerhouse sites (which will be located on granitic bedrock), across the Willard and probably across the Wildomar faults into Lake Elsinore. It is anticipated that a portion of the tailrace tunnel will be constructed in soft or loose, saturated sedimentary deposits.

The Powerhouse and Santa Rosa Substation site is located at the base of the steep, east face of the Elsinore Mountains. The powerhouse site is located in an area with surface alluvium. This material is a relatively young alluvial fan deposit of mostly gravel-sized sediment. Because of the location at the base of a steep mountain side (a location heavily influenced by gravity-induced erosion from upslope), this site is expected to contain a substantial amount of larger cobble-sized and boulder-sized clasts as well. Geophysical survey data for the powerhouse site indicate 10 to 30 feet of loose alluvial soils underlain by 60 to 125 feet of dense, unsaturated alluvial soils and/or weathered bedrock. Crystalline bedrock was encountered at depths ranging from 70 to 140 feet below the ground surface; therefore, from the data, the Applicant infers that groundwater is not present at the Powerhouse site (FERC FEIS, 2007).

Lake Elsinore water surface elevations have historically experienced significant fluctuations due to periods of flooding followed by prolonged dry periods. Lake Elsinore is a historically ephemeral lake, with the main sources of water being direct natural runoff from the surrounding mountains and drainage from the San Jacinto River. The surficial geology of this area is characterized by a transition from the alluvial fans found at the toe of the Elsinore Mountains out to the floodplain and lacustrine sediments of La Laguna. The tailrace tunnel would exit the powerhouse, which is expected to be founded on granitic bedrock, and head toward Lake Elsinore. Leaving the bedrock, the tunnel would likely be excavated through loose to dense alluvium (saturated and unsaturated) and weathered bedrock. Between the powerhouse site and Lake Elsinore are portions of the active Elsinore fault zone.

The Willard fault is located near the base of the Elsinore Mountains and runs roughly under or between the proposed powerhouse site and afterbay (Lake Elsinore). The Wildomar fault is mapped within the limits of Lake Elsinore; however, its exact location is unknown. FERC suspects that this fault crosses the alignment of the tailrace tunnel. Because the intake structure is located within the sediment of Lake Elsinore, it is expected that a portion of the tailrace tunnel would be constructed in soft or loose saturated alluvium and/or lacustrine sedimentary deposits (FERC FEIS, 2007).

The generation facilities are located in seismically-active southern California and may be subjected to strong ground motions from earthquakes during the life of the project. Portions of LEAP, including the powerhouse site and tailrace tunnel, would be located within the Elsinore Fault Zone - Glen Ivy segment. The proposed Decker Canyon Reservoir site is located within a few kilometers of the faults zone.

A historic record of earthquakes in the site vicinity available from the National Earthquake Information Center, greater than Magnitude 6.0 within a 100-mile radius of the site for the period from 1735 to present, was conducted. The search indicated that 28 earthquakes of Magnitude 6.0 and above have occurred within a 100-mile radius of the site between 1735 and 2008. The maximum magnitude encountered was the 1992 Magnitude 7.6 Landers Earthquake, located about 66 miles from the site. The closest earthquake with Magnitude 6.0 and above was the 1910 Magnitude 6.0 Elsinore Earthquake located about four miles from the site. The exact epicenter location for this event relative to the generation facilities is not known since there was no instrumentation in 1910 and the epicenter was estimated from anecdotal reports of damage within a sparsely-populated area.

Based on an assessment of available geologic, geotechnical, and seismic information, a geotechnical feasibility study concluded that there exists “no apparent geotechnical constraints to prevent the construction of the project” (GENTERRA, 2007).

Table E.6-2 summarizes the potential geology, soils, and seismicity impacts of the hydroelectric portion of the Proposed Project. Applicable PMEs, which serve to mitigate potential geology, soils, and seismicity resource impacts attributable to the hydroelectric portion of the Proposed Project are described in Table E.6-4.

Table E.6-2: Geology, Soils, and Seismicity Impacts

Impact	Description
G-1	Erosion would be triggered or accelerated due to construction activities.
G-3	Project would expose people or structures to potential substantial adverse effects as a result of seismically-induced ground shaking and/or ground failure.
G-6	Project would expose people or structures to potential substantial adverse effects as a result of landslides, earthflows, debris flows, and/or rockfall.
G-7	Project construction would result in geologic waste material

Source: The Nevada Hydro Company, Inc.

Impact G-1: Erosion would be triggered or accelerated due to construction activities.

The clearing of vegetation in the Lake Elsinore area would potentially produce erosion by disturbing the soil and removing the stabilizing vegetation. Construction of the proposed dam at Decker Canyon would use material from within the reservoir footprint to achieve a balance of excavation and fill material. Vegetation removal, excavation, and grading during construction would loosen soil or remove stabilizing vegetation and expose areas of loose soil. These areas, if not properly stabilized during construction, would potentially be subject to increased soil loss and erosion by wind and stormwater runoff.

Construction activities resulting in increased erosion and sedimentation could be potentially significant but would be mitigable to a less-than-significant level.

Impact G-3: Project would expose people or structures to potential substantial adverse effects as a result of seismically- induced ground shaking and/or ground failure.

The Willard and Wildomar faults are not identified as "active" by the State of California. The Lake Elsinore Fault Zone, however, is defined as active by the State and the Uniform Building Code (UBC, 1997) identifies the Willard and Wildomar faults as within the Glen Ivy segment of the Lake Elsinore Fault Zone. Weber (1977) also identifies geomorphic evidence of active faulting along the traces of the Willard and Wildomar faults. For planning purposes, the Willard and Wildomar faults should, therefore, be considered active. The location and activity of the Willard and Wildomar faults would be verified and evaluated during subsequent design phases. Additionally, potential ground rupture along these faults will be examined as part of those later studies to evaluate the impact of fault movement to the tailrace tunnel.

The latest USGS mapping shows that the Wildomar fault is possibly positioned beneath Lake Elsinore, a short distance from the southwestern shore. The potential lateral displacement of this fault in a magnitude 7 to 7.5 earthquake as measured on the Richter scale is estimated to be on the order of 5 to 16 feet (Berger, 1997). The direction of the Willard fault is approximately parallel to the longitudinal axes of the Powerhouse cavern, the transformer gallery, and the surge chamber (shaft). The powerhouse is centered at an elevation of approximately 1420-feet above msl ground surface contour, which would place it between the lowest surface expression of the Willard fault strands and Lake Elsinore, and the series of fault strands would be crossed by the low-pressure tunnel(s).

Because of the lateral extent (upstream-downstream) of this facility, positioning it to avoid the Willard fault zone would be extremely difficult, possibly requiring it to be moved deeper into the Elsinore Mountains or closer to the lake. The former move would affect access, and the latter move would raise a concern as to the adequacy of the rock cover (FERC FEIS, 2007). A currently unknown depth of overburden would separate the structures from the rupture surface of the Wildomar fault. A lateral displacement of the magnitude reported would likely be accompanied by substantial disturbance of the overlying materials.

The Applicant proposes a number of measures to address potential adverse geologic and geotechnical effects, including a board of three or more qualified independent engineering consultants who would assess, among other issues: (1) the geology of the site; (2) design, specifications, and construction of the dam, spillways, powerhouse, electrical and mechanical equipment, and emergency power supply; (3) instrumentation; (4) filling schedule for the reservoir and plans and surveillance during the initial filing; (5) construction procedures and progress (FERC FEIS, 2007).

Because the Project is a federally-licensed hydroelectric facility, all key design elements must conform to FERC standards and guidelines. The Project must comply with FERC's "Engineering Guidelines for the Evaluation of Hydroelectric Projects" (FERC, 2005). As stipulated in Part 12 thereof (Safety of Water Power Projects and Project Works) therein, the licensee must use sound and prudent engineering practices in any action relating to the design, construction, operation, maintenance, use, repair, or modification of a water power project or project works (Section 12.5). In accordance with Subpart D (Inspection by Independent Consultant) therein, the Project will be periodically inspected and evaluated by or under the responsibility and direction of at least one independent consultant in order to identify any actual or potential deficiencies, whether in the condition of the project works or in the quality or adequacy of maintenance, surveillance, or methods of operation, that might endanger public safety (Section 12.32).

Because the presence of an active fault or extensive adjacent shear zone whose existence was not adequately addressed in the facility's design could result in electrical supply reliability constraints if fault movement were to damage the powerhouse or its underground components. The resulting impact could be potentially significant but would be mitigable to a less-than-significant level through compliance with FERC design requirements, standards, and guidelines.

Impact G-6: Project would expose people or structures to potential substantial adverse effects as a result of landslides, earthflows, debris flows, and/or rockfall.

Slope instability, including landslides, earth flows, and debris flows during operation has the potential to undermine foundations, cause distortion and distress to overlying structures, and displace or destroy facility components. Faulting in the Lake Elsinore area has been relatively well documented (Impact G-4).

It is very unlikely that any of the activities related to construction would induce seismic instability and result in a seismic event. This includes the effects of blasting for tunnels, penstocks, and powerhouses and the effects of groundwater disturbance. However, the adverse effects of a seismic event on construction activities would be potentially substantial depending on the component of the facility being constructed. Adherence to applicable United States Occupational Safety and Health Administration (OSHA) standards would, however, ensure that workplace safety concern do not exceed a less-than-significant level (FERC FEIS, 2007).

The Project facilities located beneath steep terrain could be subjected to landslides or debris flows. Steep slopes loaded with sufficient quantities of colluvium and/or loose or weathered rock are susceptible to landslides and debris flows given sufficient initiation. This initiation could come from a seismic event, addition of water (such as might occur from a reservoir or penstock breach), concentration of hillslope runoff by a road or drainage structure onto a slope, or from a period of heavy or frequent precipitation. Unstable slopes or areas of unidentified unstable slopes could potentially fail during the facility's lifetime. Available measures including avoiding the placement of structures in unstable areas and removing or stabilizing boulders located upslope of structures, thus reducing the threat of possible slope failures or rock falls. This potentially significant impact would be mitigable to a less-than-significant level through implementation of the PMEs described in Table E.6-4.

The proposed Decker Canyon Reservoir would be classified as a "high hazard dam" or "high hazard potential structure" (FERC, 2004). Final dam design and specifications remain subject to the findings of the design-level seismic investigation conforming to FERC standards. Compliance with those design, development, and monitoring standards will ensure that the potential for dam failure and inundation of downstream areas is reduced to the maximum extent feasible

Impact G-7: Project construction would result in geologic waste material.

As proposed, only deleterious soil materials excavated from the shafts, tunnels, powerhouse cavern, and upper reservoir would be disposed of off the site; all other materials will be used in the facility's design and development (e.g., structural material for the proposed dam) or retained on the site. Excess spoil material generated in the area of the Powerhouse will be utilized as engineered fill to create a more useable development pad along Grand Avenue. With the exception of a clay-liner for the upper reservoir (the material for which is available locally), on-site and off-site borrow of geologic fill material would primarily occur internally within and between the individual construction areas and facility sites. Off-site disposal of geologic waste material and other spoils would, therefore, be reduced to the extent feasible.

6.6.2 Potential Impacts of the Primary Transmission Lines

Portions of the primary transmission lines including, but not limited to, the Santa Rosa Substation, would be located in portions of the San Jacinto River Basin. The San Jacinto River Basin is located in southern California, about 20 miles inland from the Pacific Ocean and covers more than 780 square miles of widely varying terrain. The river basin is bounded by north-south mountains, including the Santa Ana Mountains (including the Elsinore Mountains, Santa Margarita, and the Santa Rosa Plateau) to the west and the more distant San Jacinto Mountains to the east (FERC FEIS, 2007). The area spans the boundary between two geologic environments - an actively subsiding fault-bounded basin containing Lake Elsinore and a more stable mountain block underlain by minor metamorphic rocks and undivided granitic rocks of the

Peninsular Ranges Batholith. Both geologic environments are a part of the Peninsular Ranges Geomorphic Province of Southern California (FERC FEIS, 2007).

At the eastern base of the mountains is the Elsinore Basin. The geology of the Elsinore Basin comprises essentially three major units. At the surface lies alluvium from a variety of sources. Underneath the surface alluvium, is the sedimentary Pauba Formation. Under that lies the “basement rocks” of the Peninsular Ranges Batholith. The alluvial formation covers the lower portions of the valley and can be divided into alluvial fan deposits, floodplain deposits, and recent lacustrine deposits.

The Elsinore Basin is a complexly faulted trough formed by the movement along a series of parallel northwest-trending faults. This Elsinore fault zone is a part of the Whittier-Elsinore fault system. The parallel series of faults within this zone includes the Willard, Rome Hill, Wildomar, Lake, Burchkhalter, Sedco, Glen Ivy, and Freeway faults. The three main faults within the Elsinore Basin are the Willard, Wildomar, and Glen Ivy faults. These faults appear very young in age, evidenced by features such as the steep northeast side of the Elsinore Mountains to the southwest of Lake Elsinore. At its northern end, the Elsinore fault zone splays into two segments, the Chino fault and the Whittier fault. At its southern end, the Elsinore fault is cut by the Yuha Wells fault from what amounts to its southern continuation, the Laguna Salada fault.

The Elsinore fault is a part of the San Andreas fault system and runs southeast from the Los Angeles basin for about 250 km to the border of Mexico, where it continues southeast as the Laguna Salada fault. To the east are the San Jacinto and San Andreas fault zones and faults associated with the Eastern California Shear Zone. To the west is the Newport-Inglewood-Rose Canyon fault zone, which only locally comes on shore, and the offshore zone of deformation including the Coronado Bank, San Diego Trough and San Clemente faults. A comparison of the Elsinore and the San Jacinto fault zones suggests that the Elsinore fault may produce larger, less frequent earthquakes on longer segments than the nearby San Jacinto fault zone.

It is estimated that the Elsinore fault accommodates 10-15 percent of the plate-boundary slip in southern California. Previous work on the Elsinore fault has established the late Quaternary slip rate at about 4.5 to 5.5 millimeters per year (mm/yr), apparently decreasing to the southeast. The fault has been divided into five major segments, based on geometry and geomorphology, which are from north to south, the Whittier, Glen Ivy, Wildomar-Wolf Valley-Pala-Temecula, Julian, and Coyote Mountain segments.

Construction of the primary transmission line could potentially accelerate erosion. Excavation and grading activities associated with the construction of powerline and substation could cause slope instability. Primary transmission line facilities would be subject to seismic forces and could be potentially be damaged by landslides, earthflows, debris flows, or rockfalls.

Table E.6-3 summarizes the potential geology, soils, and seismic impacts of the primary transmission lines. The impacts of the primary transmission lines and T–E Line upgrades, , are examined below.

Table E.6-3:Primary Transmission Lines – Geology, Soils, and Seismicity Impacts

Impact	Description
G-1	Erosion would be triggered or accelerated due to construction activities.
G-2	Project would expose people or structures to potential substantial adverse effects as a result of problematic soils.
G-3	Project would expose people or structures to potential substantial adverse effects as a result of seismically- induced ground shaking and/or ground failure.
G-4	Project would expose people or structures to potential substantial adverse effects as a result of surface fault rupture at crossings of active faults.

Impact	Description
G-5	Project would expose people or structures to potential substantial adverse effects as a result of slope instability created during excavation and/or grading.
G-6	Project would expose people or structures to potential substantial adverse effects as a result of landslides, earthflows, debris flows, and/or rockfall.
G-7	Project construction would result in geologic waste material

Source: The Nevada Hydro Company, Inc.

Impact G-1: Erosion would be triggered or accelerated due to construction activities.

Construction of the proposed substation would potentially accelerate erosion.

The transmission line will traverse Temescal Wash, and construction activities would potentially result in sedimentation production during the rainy season.

In accordance with the CWA, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared and implemented, including appropriate Best Management Practices (BMPs), in order to minimize construction impacts on surface and groundwater quality. The SWPPP would be prepared once the action is approved and after final design is complete.

Construction activities resulting in increased erosion and sedimentation could be potentially significant but would be mitigable to a less-than-significant level with the implementation of a Storm Water Pollution Prevention Plan (SWPPP), and the additional PMEs described in Table E.6-4.

Impact G-2: Project would expose people or structures to potential substantial adverse effects as a result of problematic soils.

Potentially corrosive soils could potentially impact the chemical stability of concrete and uncoated steel used in support structures. These effects could have adverse consequences to structures or people in the vicinity of the transmission line and substation if structures were to become weakened and fail.

Expansive soils possess a shrink-swell characteristic. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may occur over a long period of time, usually the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Expansive soils may, among other things, cause foundations and flatwork to heave and become damaged.

The structural damage that may result from corrosive and expansive soils can be effectively mitigated through proper preparation of soil subgrade areas, proper foundation design, construction and maintenance of proper surface/subsurface drainage, prudent irrigation practices, and compliance with applicable code requirements.

A geotechnical study to assess soils characteristics has not yet been undertaken. Unidentified and unmitigated corrosive and expansive soils could potentially damage structures, facilities, and equipment, potentially resulting in their collapse or failure. Since the collapse of tower or damage to equipment located in the substations could produce a power outage, damage to nearby roads and structures, and serious injury to nearby people, the resulting impact could be potentially significant but would be mitigable to a less-than-significant level with the implementation of Applicant's proposed PME as detailed in Table E.6-4

Impact G-3: Project would expose people or structures to potential substantial adverse effects as a result of seismically induced ground shaking and/or ground failure.

Moderate to strong ground shaking should be expected in the event of an earthquake on the active Elsinore fault. Over its operational life, it is likely that the transmission facilities would be subjected to one or more moderate or larger earthquake occurring close enough to produce strong ground shaking. Portions of the transmission line would be subject to strong ground shaking with vertical and horizontal ground accelerations that could exceed lateral wind loads, resulting in potential damage to or the collapse of the structures. Since the collapse of the primary transmission line structures could produce a power outage, damage to nearby roads and structures, and serious injury to nearby people and property, the resulting impact could be potentially significant but would be mitigable to a less-than-significant level though the implementation of Applicant's proposed PME measures as detailed in Table E.6-4

Strong ground shaking could potentially result in seismically-induced ground failures, including liquefaction and slope failures. Portions of the primary transmission lines that cross active river washes, streams, and floodplains, where lenses and pockets of loose sand may be present and may become saturated seasonally, resulting in liquefaction damage to the primary transmission line structures should a large earthquake occur while these soils are saturated. Slope failures, such landslides and rockfalls, could occur in the event of a large earthquake along portions of the route of the primary transmission line.

Impact G-4: Project would expose people or structures to potential substantial adverse effects as a result of surface fault rupture at crossings of active faults (Class II).

Because portions of the proposed primary transmission line traverse seismic hazard zones, transmission and subtransmission facilities could be subject to surface fault rupture hazards. Since the collapse of transmission or subtransmission structures could produce a power outage, damage to nearby roads and structures, and serious injury to people, the resulting impact could be potentially significant but would be mitigable to a less-than-significant level through the implementation of the Applicant's PME measures as detailed in Table E.6-4.

Implementation of these PMEs will ensure proper placement of conductors and allow distribution of fault displacements over a comparatively long span, such that the primary transmission line would be less likely to collapse in the event of an earthquake.

Impact G-5: Project would expose people or structures to potential substantial adverse effects as a result of slope instability created during excavation and/or grading.

Since the proposed primary transmission line follows an existing corridor, new access and spur roads would not be required to be constructed to access the primary transmission line for construction and maintenance purposes.

The United States Geological Survey (USGS) has developed a generalized debris flow hazard map that includes the proposed transmission area. Areas with slopes of 26 degrees or greater are highlighted on the map and correspond with slopes capable of producing debris flows given critical rainfall conditions. There are no areas indicated to have potential for debris flows in the area.

This impact of these conditions is potentially significant but has been avoided through the routing of the primary transmission line.

Impact G-6: Project would expose people or structures to potential substantial adverse effects as a result of landslides, earthflows, debris flows, and/or rockfall.

The primary transmission line will not be located in steep terrain that could be subjected to landslides or debris flows.

Since slope failure is unlikely, there is a low likelihood of potential collapse of primary transmission line structures. Therefore the a resulting power outage, or damage to nearby roads and structures, and serious injury to people is unlikely.

Impact G-7: Project construction would result in geologic waste material.

Construction of the primary transmission line would result in minimal grading operations. With the limited exception of organics, grading activities will be balanced and geologic waste materials will be minimized. As a result, no impact associated with geologic waste material is anticipated. Accordingly, Applicant has not proposed any PMEs to address this potential impact.

6.6.3 Cumulative Impact of the Project - Geology, Soils, and Seismicity

Impacts to geology, soils, and seismicity from the primary transmission lines are presented in Section 5.6.2 Impacts to geology, soils, and seismicity from the Project are presented in Section 5.6.1. The cumulative impacts to geology, soils, and seismicity resulting from the implementation of the Project (inclusive of both the primary transmission lines and generation facilities) would be similar to the combined effects presented in those two preceding sections.

Table E.6-4: PMEs Proposed - Geology, Soils, and Seismicity

Measure	Description
G-1	Include specific provisions in the proposed erosion control plan that applies erosion control measures and BMPs to all construction locations, including the upper reservoir, drainage and flood control locations, penstock tunnels, powerhouse, tailrace, inlet/outlet structure, transmission lines, and all associated construction laydown areas and temporary on-site borrow areas for all subsequent ground disturbing activities over the term of any license issued for the project.
G- 2	Achieve the balance of excavation and fill material at the upper reservoir site (through additional excavation) and dispose of other excavation materials from the construction of project facilities (except the upper reservoir) off site.
G-3	Retain a board of three or more qualified independent engineering consultants experienced in critical disciplines, such as geotechnical, mechanical, and civil engineering, to review the design specifications and construction of the project for safety and adequacy.
G-4	Conduct additional geotechnical studies.
G-5	Develop an erosion control plan prior to construction.
G-6	Develop and implement a plan to monitor dissolved oxygen (DO) and temperature downstream of the tailrace in Lake Elsinore and in Temescal Wash during project operation.
G-7	To the maximum extent feasible, achieve a balance of excavation and fill materials at the project site by using excavated materials form the intake, powerhouse, penstock, tunnel, and upper reservoir excavation in the construction of the upper reservoir dam and embankments.
G-8	Before starting construction, the Applicant shall retain a board of three or more qualified independent engineering consultants experienced in critical disciplines such as geotechnical, mechanical, and civil engineering, to review the design specifications, and construction of the project for safety and adequacy. The Applicant shall submit two copies of a letter with the names and qualifications of the board members for FERC's approval of the board and one copy shall be sent to the Regional Director (FERC). Among other things, the board shall assess the following: (1) the geology of the project site and surroundings; (2) the design, specifications, and construction of the dike(s), dam(s), spillways(s), powerhouse(s), electrical and mechanical equipment, and emergency power supply; (3) instrumentation; (4) the filling schedule for the reservoir(s) and plans and surveillance during the initial filling; and (5) construction procedures and progress. Before each meeting, the Applicant shall furnish members of the board of consultants the following: (1) a statement of the specific level of review the board is expected to

Measure	Description
	provide; (2) an agenda for the meeting; (3) a list of the items to be discussed with the board; (4) a discussion of significant events in the design and construction that have occurred since the last board meeting; (5) drawings of the design and construction features; and (6) documentation for the details and analyses of the design and construction features to be discussed. The Applicant shall ensure that the board of consultants has sufficient time to review these items before each meeting. At the same time as a copy of these items is provided to the board of consultants, the Applicant shall also send two copies to the FERC and one copy to the Regional Office (FERC). Within 30 days after each board of consultants meeting, the Applicant shall submit to FERC copies of the board's report and a statement of intent to comply with the board's recommendations or a statement of a plan to resolve the issue(s). The Applicant shall send two copies of this submission to FERC and one copy to the Regional Director (FERC). The board's review comments shall be submitted prior to or simultaneously with the submission of the final contract drawings and specifications accompanied by a supporting design report required to be filed with FERC. Within one year after completion of construction, the Applicant shall file two copies with FERC of the board's final report, which shall contain a statement indicating the board's opinion with respect to the construction, safety, and adequacy of the project structures.
G-9	At least 180 days before the start of project construction, the Applicant shall file with FERC, for approval, a plan for the design and construction of a system that will automatically detect a conduit or penstock failure and immediately shut off flow in the conduit or penstock at the headworks in the event of such a failure. The plan, at a minimum, shall include: (1) design drawings; (2) a schedule for installation and testing of the system prior to operation of the project; (3) a schedule for annual testing of the system for the life of the project; and (4) a description of contingency measures to manually close off the conduit or penstock when the system is not operational. The Commission reserves the right to require changes to the plan. Project construction shall not begin until the Applicant is notified by the FERC that the plan is approved. Upon FERC approval, the Applicant shall implement the plan, including any changes required by FERC.
G-10	At least 180 days before the start of any land-disturbing or land-clearing activities, the Applicant shall file with FERC, for approval, a plan for clearing the reservoir area. The plan, at a minimum, shall include: (1) topographic maps identifying the location and acreage of lands to be cleared; (2) descriptions of the vegetation to be cleared; (3) descriptions of any resource management goals related to fish and wildlife enhancement through vegetative clearing or retention; (4) descriptions of the disposal methodologies and disposal location of unused timber, brush and refuse, and maps identifying the location of disposal sites; and (5) an implementation schedule. The Applicant shall prepare the plan after consultation with appropriate agencies. The Applicant shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. The FERC reserves the right to require changes to the plan. No land-disturbing or land-clearing activities shall begin until the Applicant is notified by FERC that the plan is approved. Upon FERC approval, the Applicant shall implement the plan, including any changes required by FERC.
G-11	At least 180 days before the start of any land-disturbing or land-clearing activities at the project, the Applicant shall file with the FERC, for approval, a plan to revegetate disturbed areas with plant species beneficial to wildlife. The plan shall describe the location of the areas to be revegetated and, at a minimum, shall include: (1) a description of the plant species used and planting densities; (2) fertilization and irrigation requirements; (3) a monitoring program to evaluate the effectiveness of the planting; (4) provisions for the filing of monitoring reports with

Measure	Description
	the Commission; (5) a description of procedures to be followed if monitoring reveals that the revegetation is not successful; and (6) an implementation schedule that provides for revegetation as soon as practicable after the beginning of land-clearing or land-disturbing activities with the disturbed area. The Applicant shall prepare the plan taking into account fully the erosion, dust, slopes, and sediment control plan prepared pursuant to this license, and after consultation with the appropriate agencies and with any Federal agency with managerial authority over any part of project lands. The Applicant shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The Applicant shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the FERC. If the Applicant does not adopt a recommendation, the filing shall include the Applicant's reasons, based on project-specific information. The FERC reserves the right to require changes to the plan. No land-disturbing activities shall begin until the Applicant is notified by the FERC that the plan is approved. Upon FERC approval, the Applicant shall implement the plan, including any changes required by the FERC.

Source: The Nevada Hydro Company, Inc.

BLUEWATER
RENEWABLE ENERGY STORAGE

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E
ENVIRONMENTAL REPORT
SECTION 7 – REPORT ON RECREATIONAL RESOURCES

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

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EXHIBIT E – SECTION 7 REPORT ON RECREATIONAL RESOURCES

As required under 18 CFR 4.41(f)(7), the Applicant is to provide a report containing a proposed recreation plan describing utilization, design and development of project recreational facilities, and public access to the project area. Development of the plan should include consideration of the needs of the physically handicapped. Public and private recreational facilities provided by others that would abut the project should be noted in the report. The report must be prepared in consultation with appropriate local, regional, state and Federal recreation agencies and planning commissions, the National Park Service of the U.S. Department of the Interior, and any other state or Federal agency with managerial responsibility for any part of the project lands. The report must contain:

1. A description of any areas within or in the vicinity of the proposed project boundary that are included in, or have been designated for study for inclusion in:
    a. The National Wild and Scenic Rivers Systems (see 16 U.S.C. 1271);
    b. The National Trails System (see 16 U.S.C. 1241); or
    c. A wilderness area designated under the Wilderness Act (see 16 U.S.C. 1132);
2. A detailed description of existing recreational facilities within the project vicinity, and the public recreational facilities which are to be provided by the applicant at its sole cost or in cooperation with others no later than 3 years from the date of first commercial operation of the proposed project and those recreation facilities planned for future development based on anticipated demand. When public recreation facilities are to be provided by other entities, the applicant and those entities should enter into an agreement on the type of facilities to be provided and the method of operation. Copies of agreements with cooperating entities are to be appended to the plan;
3. A provision for a shoreline buffer zone that must be within the project boundary, above the normal maximum surface elevation of the project reservoir, and of sufficient width to allow public access to project lands and waters and to protect the scenic, public recreational, cultural, and other environmental values of the reservoir shoreline;
4. Estimates of existing and future recreational use at the project, in daytime and overnight visitation (recreation days), with a description of the methodology used in developing these data;
5. A development schedule and cost estimates of the construction, operation, and maintenance of existing, initial, and future public recreational facilities, including a statement of the source and extent of financing for such facilities;
6. A description of any measures or facilities recommended by the agencies consulted for the purpose of creating, preserving, or enhancing recreational opportunities at the proposed project, and for the purpose of ensuring the safety of the public in its use of project lands and waters, including an explanation of why the applicant has rejected any measures or facilities recommended by an agency; and
7. A drawing or drawings, one of which describes the entire project area, clearly showing:
    a. The location of project lands, and the types and number of existing recreational facilities and those proposed for initial development, including access roads and trails, and facilities for camping, picnicking, swimming, boat docking and launching, fishing and hunting, as well as provisions for sanitation and waste disposal;
    b. The location of project lands, and the type and number of recreational facilities planned for future development;

c. The location of all project lands reserved for recreational uses other than those included in paragraphs (f)(7)(vii) (A) and (B) of this section; and

d. The project boundary (excluding surveying details) of all areas designated for recreational development, sufficiently referenced to the appropriate Exhibit G drawings to show that all lands reserved for existing and future public recreational development and the shoreline buffer zone are included within the project boundary. Recreational cottages, mobile homes and year-round residences for private use are not to be considered as public recreational facilities, and the lands on which these private facilities are to be developed are not to be included within the proposed project boundary.

7.0 REPORT ON RECREATIONAL RESOURCES

7.1 Recreational Environmental Setting

Recreational facilities located within the Cleveland National Forest (CNF), the City of Lake Elsinore, and the County of Riverside are separately discussed below.

Cleveland National Forest. The upper reservoir and some of the underground facilities related to the pumped storage component of the Project are located within the CNF. Within the CNF, the Proposed Project facilities are located within the Trabuco Ranger District (TRD), one of three Ranger Districts within the CNF. The CNF is the southernmost of the national forests in California. Its approximately 567,000 acres are located in Orange, Riverside, and San Diego Counties, at elevations ranging from 460 to 6271-feet above mean sea level (AMSL). Camping, picnicking, hiking, equestrian use, and sight-seeing are popular National Forest activities. Recreational use of the CNF during fiscal year 2001 was "0.79 million National Forest visits +/- 31 percent. There were 0.83 million site visits, an average of 1 site visit per national forest visit. Included in the site visit estimate are 31,616 Wilderness visits."[1] Developed recreational facilities can accommodate about 4,200 persons at one time.[2]

Based on the most recent day-use survey conducted within the CNF, it was determined that, among the day-use site visitors, approximately two-thirds were male (66 percent). Most CNF day-use visitors were recreating with family and friends, visit for one to three hours, were repeat visitors, and planned to return to sites on the CNF.[3]

Recreational opportunities within the Trabuco Ranger District (TRD) include, but are not limited to, camping, picnicking, hiking, backpacking, mountain biking, wildlife observation, and hang gliding. There are several facilities that accommodate those activities. Developed recreational complexes at Black Star Canyon, Blue Jay, El Cariso, Fry Canyon Observatory, Laguna Mountain, San Juan Canyon, and Trabuco Canyon. USDA Forest Service operated campgrounds within the TRD include: (1) Blue Jay (55 sites), located west of SR-74 on Long Canyon Road; (2) El Cariso North (24 sites), located west of SR-74 near Killen Truck Trail; (3) Upper San Juan (18 sites), located along SR-74 and southwest of Decker Canyon; and (4) Wildomar (12 sites), located east of the area of Rancho Capistrano (Morrell Potero) and south of Elsinore Peak. Ortega Oaks Campground is an additional facility located along SR-74 within the TRD but is privately owned and operated. Trails designated for non-motorized use provide access to the National Forest by hikers, equestrian riders, and mountain bikers. There are currently about 327 miles of designated trials within the CNF.[4]

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[1]/ Kocis, Susan M., et al., National Visitor Use Monitoring Results, USDA Forest Service Region 5, Cleveland National Forest, August 2002, p. 9.

[2]/ Chavez, Deborah J., Managing Outdoor Recreation in California: Visitor Contact Studies 1989-1998, General Technical Report PSW-GTR-180, United States Forest Service, Pacific Southwest Research Station, January 2001, p. 7.

[3]/ Ibid., p. 26.

[4]/ United States Fish and Wildlife Service, Biological and Conference Opinions on the Continued Implementation of Land and Resource Management Plans for the Four Southern California National Forests, as Modified by New Interim Management Direction and Conservation Measures (1-6-00-F-773.2), February 27, 2001, p. 9.

To the south and east of the proposed upper reservoir site is the existing Wildomar Off-Highway Vehicle (OHV) area, located along Wildomar Road, south of Elsinore Peak. There are currently approximately 54 miles of designated OHV routes within the CNF.[5]

Management of recreation activities in the CNF is achieved by the incorporation of "Recreation Opportunity Spectrum" (ROS) into the Forest Plan. The ROS is a framework for defining classes of outdoor recreation environments, activities, and experience opportunities within the National Forest. The opportunities are arranged along a continuum or spectrum divided into classes which define recreation opportunities within various areas of the forest Table E.7-1 describes the four ROS classes that occur within the TRD in proximity to the Project.

The 39,450-acre San Mateo Canyon Wilderness is located south and east of the proposed Lake-Case Springs transmission alignment. In the Project area, the wilderness is accessible via an improved trail system (Morgan Trail) and provides only non-motorized forms of access. No trails in the vicinity of the Project are designated as National Recreation Trails.

Within the CNF, recreational use during 2001 was estimated at 790,000 National Forest visits (based on a margin of error of 31 percent). There were 830,000 site visits, representing an average of one site visit per National Forest visit. Included in the site visit estimate are 31,616 wilderness visits. This level of use is attributed to the entire 460,000-acre CNF, which includes areas not in the vicinity of the Project.

Table E.7-1: Description of Recreational Opportunity Spectrum Classes

ROS Class	Description of Recreation Opportunity Setting
Primitive (P)	Very high probability of solitude and closeness to nature, challenge and risk; essentially unmodified natural environment; minimal evidence of others; few restrictions evident; non-motorized access and travel on trails or cross country; no vegetation alterations; at least 5,000 acres in size; at least 3 miles from the nearest road or trails with motorized use.
Semi-primitive, Non-motorized (SPNM)	High probability of solitude, closeness to nature, challenge and risk; natural appearing environment; some evidence of other users; subtle restrictions and controls are evident; non-motorized access and travel on trails; vegetative alterations occur but are widely dispersed and not too evident; at least 2,5000 acres in size, at least 0.5 mile from all roads, railroads or trails with motorized use.
Semi-Primitive, Motorized (SPM)	Moderate probability of solitude, and closeness to nature; high degree of challenge and risk using motorized equipment; predominately natural appearing environment; few users but evidence on trails; minimum or subtle on-site controls; vegetative alterations occur but are few; at least 2,500 acres in size; at least 0.5 mile from all roads, railroads, or trail with motorized use, but may contain roads that are usually closed.
Roaded Natural (RN)	Some probability of solitude; little challenge and risk; mostly natural appearing environment; moderate concentration of users at developed and dispersed campsites; some obvious site restrictions and user controls are present; access is motorized; vegetative alterations completed to maintain desired visual characteristics; no size restrictions.

Source: USDA Forest Service

In 2003, the USDA Forest Service has granted to the Elsinore Hang Gliding Association (EHGA) a revocable special use permit (SUP) for the use of two launch sites for recreational hang gliding and paragliding along South Main Divide Truck Trail. As indicated in that SUP: "This permit covers 2 acres, and/or 0 miles and is described as: NE ¼ of SEC 22 and SE ¼ of SEC 23, T6S R5W (SBM) as shown on the location map attached

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[5]/ Id., Biological and Conference Opinions on the Continued Implementation of Land and Resource Management Plans for the Four Southern California National Forests, as Modified by New Interim Management Direction and Conservation Measures (1-6-00-F-773.2), pp. 8-9.

to and made a part of this permit, and is issued for the purpose of: Maintaining and operating two launch sites, Edwards and E for hang gliders and paragliders that include three outlying windsocks." Hang gliders launching from those sites land at a number of locations near Lake Elsinore.

City of Lake Elsinore. Lake Elsinore is a shallow natural lake with the deepest area located in the southwest section of the main basin. Recreation on the lake include boating and fishing. The lake bottom is nearly level at an elevation of 1223-feet AMSL. The approximate volume and surface area of the lake's main basin, in relation to its elevation, is listed in Table E.7-2. Steeper shoreline slopes existing on the north and south banks (5-10 percent), while flatter slopes exist along the east and west banks (1.5-2 percent).[6] When the lake water level drops to low levels, the lake becomes unusable for recreation.[7]

Table E.7-2: Water Elevation and Volume in the Lake Elsinore Main Basin

Lake Elevation (feet AMSL)	Lake Volume (acre-feet)	Surface Area (acres)
1236	26,935	2,892
1240	38,519	3,074
1245	54,504	3,319
1250	71,443	3,463
1255	89,114	3,606
1260	107,877	3,882

Source: City of Lake Elsinore

Climate in the Elsinore Valley is generally comprised of warm, dry summers and mild winters. Virtually all the rainfall within the region occurs during winter months. Due to the area's semi-arid climate, water levels within Lake Elsinore have historically experienced significant fluctuations due to periods of flooding followed by prolonged dry periods. Lake Elsinore is a historically ephemeral lake whose main sources of water have been direct natural run-off from the surrounding mountains and drainage from the San Jacinto River. Evaporation losses have historically exceeded natural inflows into the lake. Left unmanaged, the lake has been known to be completely dry in severe drought conditions. In the last 75 years, average annual lake inflow has exceeded evaporative losses only 15 times. When the lake is low, fish have died and recreational use has stopped or been substantially curtailed (the lake actually went dry in the 1960's).

Although it represents the largest natural freshwater lake in southern California, the level of recreational use of Lake Elsinore, while significant, can be assumed to be substantially less than would be expected if the lake levels were to be stabilized and if the lake's water quality were improved.

In response to these conditions, a lake stabilization project was initiated by the Lake Elsinore Management Authority (LEMA), a Joint Power Authority, in 1993. The LEMA subsequently adopted the "Lake Elsinore Management Plan" to alleviate these conditions and promote shoreline development. The $55 million management project, which included the construction of a 2.5-mile long levee by the United States Army Corps of Engineers, was designed to ease extreme flooding and evaporative losses in the lake. Major earthwork construction was undertaken at the lake beginning in June 1989 with the majority of the work completed by March 1991. The key physical features of the plan included a main levee, a lake inlet system, an operations island, new groundwater wells and water distribution system, and a wetlands and riparian mitigation area. The stated objectives of these features included water quality improvement, irrigation supply, flood protection, outdoor recreational enhancement, and fish and wildlife enhancement. One of

6/ City of Lake Elsinore (Noble Consultants, Inc.), Lake Elsinore Master Plan/Economic Feasibility Study (1995-2015), September 16, 1994, pp. III-1 and III-2.

7/ *Id.*, p. III-8.

the functions of these physical features was to maintain the lake's operating range between 1240 and 1249-feet above msl the wetlands water level at approximately 1240-feet AMSL.

"Lake Elsinore currently has an annual water deficit of about 7,500 acre-feet and about 15,000 acre-feet in dry years. The Lake typically experiences a four to five-foot elevation drop in normal years. The Lake has dried up completely in certain years. These elevation changes have resulted in significant adverse impacts on the quality and beneficial uses of the Lake, including contact and non-contact recreation, warm water aquatic habitat, and wildlife habitat."[8] These impacts, in turn, result in significant adverse impacts on the economy of the surrounding community. In 2000, there were 41,250 recreation visitor days from local residents to the lake and 177,300 visitor days from out-of-area visitors. Most users were boaters. Only 5 to 20 percent of the estimated lake use was associated with angling.

The most important condition affecting recreation use at Lake Elsinore is the water level. Between 1992 and 1999, the surface elevation of Lake Elsinore fluctuated between 1229 and 1259-feet AMSL. At lake levels below 1240-feet AMSL, the water quality of Lake Elsinore declines significantly and adversely impacts recreational use. This poor water quality exists because warm water resulting from lowering lake levels creates excessive algal growth. This excessive algal growth removes dissolved oxygen from the water column as it grows and decays, which leads to sporadic fish kills. Both the fish kills and abundant algae create unpleasant conditions and potentially unsafe conditions for water recreation.

Lake levels affect various recreational opportunities. Warm water resulting from lowering water levels tends to favor fish populations of carp and shad, fish anglers do not highly value. In addition, the lake level affects the condition of the shoreline. Table E.7-3 depicts changes in the shoreline location associated with lake level fluctuations at the following locations: (1) Lakeshore Drive and Riverside Drive, (2) Park at Chaney Street and (3) Riverside County Park in Lakeland Village.

As illustrated in Figure E.7-3,[9] there are eight primary boat launch sites along the perimeter of Lake Elsinore, including Playground Park, Weekend Paradise and Crane's Marina, Elsinore West Marina, Roadrunner and Lake Elsinore Recreation Area, Seaport, and Outhouse. Revenues generated through the sale of lake day use passes at those launch sites provide a significant source of revenue to the City of Lake Elsinore, and is presented in Table E.7-4.

Table E.7-3: Shoreline Locations Potentially Affected by Lake Level Fluctuations

Shoreline Location	Change in Surface Level Elevation (feet AMSL)	Resulting Horizontal Shoreline Movement (receding shoreline in feet)
Lakeshore Drive and Riverside Drive	1240 to 1242 1240 to 1247	112 feet 415 feet
Park at Chaney Street	1240 to 1242 1240 to 1247	21 feet 81 feet
Riverside County Park - Lakeland Village	1240 to 1242	21 feet

Source: Elsinore Valley Municipal Water District

There are four fishing beaches along the lake (Elm Grove, Lowell Street, Davis Street, and Whiskers). No swimming is allowed but wading is permitted in designated areas. With regards to lake use, Federal, State, and local laws are enforced by the Riverside County Sheriff's Department, Lake Patrol.

8/ California Regional Water Quality Control Board, Santa Ana Region, Order No. R8-2002-0009-A01, January 23, 2002, p.1.

9/ City of Lake Elsinore, Lake Use Regulations, December 2006.

Table E.7-4: City of Lake Elsinore Revenues From Day Use Passes (2004)

Location	Revenue
Bedrock RV Park	$ 70.00
Cranes Lakeside Park	11,900.00
Elsinore West Marina	83,300.00
Hardin Marine Arrowhead	350.00
Newport Boats	700.00
Playland RV Park	5,950.00
Pyramid Enterprises	104,979.00
The Outhouse	1,050.00
Weekend Paradise	5,600.00
Total	$213,899.00

Source: City of Lake Elsinore

As indicated in the "Lake Elsinore Master Plan/Economic Feasibility Study (1995-2015)" (Lake Master Plan): "During the previous decades, Lake Elsinore was used for recreational boating, fishing, swimming and camping by thousands of people from the Los Angeles, Orange County and San Diego areas. There were reported to be as many as 1,000 to 1,200 boats on the lake and along its shoreline at any one time. In more recent times, with the development of many first class recreational complexes in southern California, and with the ongoing problems of water quality and either a lake water level that was too high or too low, most of the earlier recreational crowd from nearby counties have chosen to go elsewhere. . .Presently, there is minimum boat access to the lake by use of launch ramps when water levels exceed 1240 feet; there are no marinas for the berthing of boats; and there are minimum recreational and commercial facilities along the lake's shoreline."[10] Roughly 95 percent of the use of Lake Elsinore has been from some form of power boating.[11]

The planned lake operating level is between 1240 and 1249-feet AMSL. When the lake is at a level of 1245-feet AMSL, there is approximately 3,000 water surface acres available for boating operations, plus approximately 80 acres of water surface area available for water ski school concessions and competition boating special events within the San Jacinto channel. Of the 3,000 acres of surface area available for boating activities in the main lake, 2,236 acres are with the "active zone" (5-40 mph and designated high-speed zone), while the remainder is within the lake's perimeter five mph "no wake" zone." A maximum water use capacity of 1,200 boats at one time is recommended after the lake has been improved in accordance with the Lake Master Plan. The maximum peak day boat count would be 1,560 boats. A "water access improvement plan" and "development of lakefront facilities" is recommenced to support the maximum boating capacity and lake access improvement plan.[12]

As indicated in the Lake Master Plan, in order to initiate the active recreational use of the lake and encourage private-sector participation in the lake's development, the City of Lake Elsinore recommended that initial development of proposed lakefront facilities be prioritized in the following order: (1) public boat launch ramp that can accommodate the range in design lake water levels and that has sufficient adjacent boat trailer/car parking and other necessary improvements; (2) special events area that can

[10]/ City of Lake Elsinore (Noble Consultants, Inc.), Lake Elsinore Master Plan/Economic Feasibility Study (1995-2015), September 16, 1994, p. I-1.

[11]/ Id., pp. III-4 and III-5.

[12]/ Id., pp. I-2 through I-4.

successfully promote and stage professional-level competition boating events; (3) swimming beach area with sufficient support facilities for families to truly enjoy the recreational beachside activities provided by the lake; (4) marina boat berthing facility with supporting landside marine concessions and a restaurant for the general public's enjoyment of waterfront boating activities; (5) improvement of either the existing City park and campgrounds or the existing Elsinore West Marina RV park and campgrounds to allow for enhanced waterside camping sites for the general public and to provide additional boat launching, beach, and marina facilities; (6) development of recreation island as a world-class destination resort in combination with a marina, swimming beach, parkland, and a youth and group facility for the general public's use; and (7) development of public shoreline areas with pedestrian linear greenbelt walkways, boat beaches, benches, shade structures, and restroom facilities.[13]

Along the eastern perimeter of the lake, the Lake Master Plan proposed that the existing 17,800 linear foot of earthen levee be improved into a linear greenbelt pedestrian walkway for walking, jogging, bicycling, picnicking, and enjoying lake views.[14]

The Lake Master Plan includes a "specific lake management plan" which incorporates conceptual plans for proposed lakefront improvements. With regards to the "Grand Avenue Area," which would include that portion of Lake Elsinore located in proximity to the proposed Santa Rosa Substation, Powerhouse, primary transmission line and intake/outlet structures, the Lake Master Plan states: "Grand Avenue, on the southwesterly side of the lake, consists primarily of private residential developments. A majority of this shoreline is within the County of Riverside boundaries, which includes three homeowner's associations and four commercial developments. Three of the commercial properties are RV parks, while the fourth is a boat sales/repair facility. The old military academy is located between the lakefront and Grand Avenue just within the City limits near the Riverside Drive end of Grand Avenue. Due mainly to private residential properties and limited public lake access along Grand Avenue, the only proposed lakefront improvements is to the approximately 40-acre parcel of land consisting of the old Military Academy and adjacent vacant land parcel, referred to as the Nautical Center. In addition, a future personal watercraft restricted area and a lake fishing area are identified within the lake adjacent to the Grand Avenue shoreline."[15] The proposed "fishing zone" would be located within the lake at the southeasterly end of Grand Avenue, extending up to the levee and island.

As indicated by the Lake Elsinore and San Jacinto Watersheds Authority (LESJWA): "Lake Elsinore is a eutrophic, warm polymictic lake. Its eutrophic condition is sustained by a high rate of nutrient recycling and release from sediments, especially phosphorus that is usually limiting. Several severe fish kills occurred at Lake Elsinore since 1990 due to oxygen depletion. Lake Elsinore's sport fishery is poor quality as a result of competition with non-game fishes and bird predation. Threadfin shad (non-game fish) are largely responsible for the poor sport fishery since shad compete with young game fishes for food, reduce game fish survival, and attract fish eating birds that prey on young game fish and further reduce their survival. Shad also reduce population densities of large zooplankters that more efficiently harvest phytoplankton algae. This reduced grazing pressure on algae contributes to greater algal densities, instabilities in algae, and oxygen depletions resulting in fish kills."[16]

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[13]/ Ibid., p. I-6.

[14]/ Ibid., p. I-5.

[15]/ Id., p. V-6.

[16]/ Fast, Arlo W., Proposed Lake Aeration and Biomanipulation for Lake Elsinore, California, May 2002, p. 2.

County of Riverside. Lee (Corona) Lake is located in unincorporated Riverside County and is a man-made reservoir owned by the Elsinore Valley Municipal Water District (EVMWD). Boating and fishing are permitted and unimproved launch facilities and boat rental opportunities are available.

As indicated in the Riverside County General Plan, the "shortage of recreational facilities today is not so much in the quantity of land available, but in the completeness of the development of the recreational facilities within each park."[17]

That planning document further states that "[t]he County recognizes the need for neighborhood and community parks. Development and operation of such facilities will not be the responsibility of the County" and "[w]hen planning future park sites, consideration will be made to locate new parks adjacent to or in combination with school sites."[18] As a result, the focus of the proposed "recreation plan," within unincorporated County areas, is toward the provision of neighborhood or community serving recreational facilities.[19]

Topography near the Project and local meteorological conditions (known as the Elsinore Convergence) provide suitable conditions for hang gliding. Lake Elsinore is known for providing high-quality hang gliding and paragliding opportunities.

The Elsinore Convergence is the name given to the mixing of the cool, moist ocean air stream from the northwest meeting the warm, dry desert air stream from the southeast. These colliding air streams, or convergence zones, drive air masses up into the atmosphere generally along a defined shear line. Hang glider and parasailing pilots launch into this air space in search of the rising air masses (also known as thermals) that allow pilots to generate ascents of 10,000 or more within minutes of launching.

The Elsinore Convergence, is fairly consistent, reportedly creating suitable conditions for hang gliding about 300 days a year. The area has an estimated total use of 500 users per year, 100 of which are regular and consistent users. Presently, hang gliders aloft at a number of ridgeline locations along South Main Divide Truck Trail within close proximity to the upper reservoir site. In the Lake Elsinore area, parachuting and gliding activities are conducted from Skylark Airport.

7.2 Recreational Regulatory Setting

The following general discussion is presented of certain Federal, State, and local statutes and regulations that may be most applicable to an understanding of the Project's regulatory setting.

Federal Power Act. Section 4(e) of the FPA (16 U.S.C. 797[e]) provides, in part: "In deciding whether to issue any license under this subchapter for any project, the Commission, in addition to the power and development purposes for which licenses are issued, shall give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, the preservation of other aspects of environmental quality."

Federal Water Project Recreation Act of 1965. The Federal Water Project Recreation Act of 1965 (PL 89-72) reestablished recreation as a full project purpose, directing that full consideration be given to the outdoor recreation opportunities, if any, of any Federal navigation, flood control, reclamation,

[17]/ Id., County of Riverside Comprehensive General Plan, p. 235.

[18]/ Id., p. 241.

[19]/ For the purpose of this exhibit, the terms "neighborhood" and "community" park are assumed to be interchangeable. The two terms are not used herein to suggest any differentiation between those two park types with regards to how any local park district and/or municipality may define or categorize those facilities.

hydroelectric, or multipurpose water resource project. The act also placed additional requirements on recreation as a project purpose, defining the basis for sharing financial responsibilities in joint development, enhancement, and management of recreation and fish and wildlife resources of Federal water projects. This act further requires beneficiaries to bear part of the costs of operating and maintaining recreation developments at Federal water resources projects.

Electric Consumers Protection Act of 1986. Under the Electric Consumers Protection Act of 1986 (PL 99-495) (ECPA), which amended the FPA, both power and non-power aspects must receive equal consideration in determining the best use of the water resource. The ECPA required that FERC give equal consideration to environmental concerns, such as protecting fish and wildlife and enhancing recreation and conservation, as well as energy concerns, in making licensing and relicensing decisions.

Code of Federal Regulations. FERC is required to evaluate the recreational resources of all hydropower projects under Federal license or applications and seek, within its authority, the ultimate development of these resources, consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project. Reasonable expenditures by a licensee for public recreational development pursuant to an approved plan, including the purchase of land, will be included as part of the project cost (18 CFR 2.7).

Executive Order 12962. Under Executive Order 12962, as signed by President Clinton on June 7, 1995, all Federal agencies are instructed to revise and increase their efforts toward recreational fisheries in order to provide for increased recreational fishing opportunities nationwide. As specified therein: “Federal agencies shall, to the extent permitted by law and where practicable, and in cooperation with States and Tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by: (a) developing and encouraging partnerships between governments and the private sector to advance aquatic resource conservation and enhance recreational fishing opportunities; (b) identifying recreational fishing opportunities that are limited by water quality and habitat degradation and promoting restoration to support viable, healthy, and, where feasible, self-sustaining recreational fisheries; (c) fostering sound aquatic conservation and restoration endeavors to benefit recreational fisheries; (d) providing access to and promoting awareness of opportunities for public participation and enjoyment of U.S. recreational fishery resources; (e) supporting outreach programs designed to stimulate angler participation in the conservation and restoration of aquatic systems; (f) implementing laws under their purview in a manner that will conserve, restore, and enhance aquatic systems that support recreational fisheries; (g) establishing cost-share programs, under existing authorities, that match or exceed Federal funds with non-Federal contributions; (h) evaluating the effects of federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order; and (i) assisting private landowners to conserve and enhance aquatic resources on their lands.”

Americans with Disabilities Act of 1990. The ADA was created to protect the civil rights of persons with disabilities and established requirements to ensure that buildings, facilities, rail passenger cars, and vehicles are accessible, in terms of architecture and design, transportation, and communication, to individuals with disabilities. Titles II and III of the ADA apply to licensee's recreation facilities and requires public and private entities which have "public accommodations" to be accessible to persons with disabilities. FERC requires new facilities and accessible areas to comply with ADA requirements.

The term "place of public accommodation'' as a facility, operated by a private entity, whose operations affect commerce and fall within at least one of twelve specified categories. The term "public accommodation'' is reserved for the private entity that owns, leases (or leases to), or operates a place of public accommodation. It is the “public accommodation” and not the “place of public accommodation” that is subject to the regulation's nondiscrimination requirements. Both “places of recreation” and “places of exercise or recreation” are specifically listed among the twelve “public accommodations.”

On October 18, 2000 (65 FR 62498), the Architectural and Transportation Barriers Compliance Board issued final accessibility guidelines (36 CFR Part 1191) to serve as the basis for standards to be adopted by the Department of Justice for new construction and alterations of play areas covered by the ADA. The guidelines include scoping and technical provisions for ground-level and elevated play components, accessible routes, ramps and transfer systems, ground surfaces, and soft contained play structures. The guidelines are intended to ensure that newly constructed and altered play areas meet the requirements of the ADA and are readily accessible to and usable by individuals with disabilities.

The design of public recreational facilities must conform to the Americans with Disabilities Act of 1990 (42 U.S.C. 12101-12213) (ADA) accessible requirements and, where applicable, with the Architectural Barriers Act of 1968 (42 U.S.C. 4151 et seq.) (ABA), "Americans with Disabilities Act Standards for Accessible Design" (28 CFR Part 36), "Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines,"[20] and the "Uniform Federal Accessibility Standards."[21] In 1993, the USDA Forest Service's policy on accessibility to comply with ADA requirements was provided in the "Universal Access to Outdoor Recreation: A Design Guide" (PLAE Inc., 1993).

On May 22, 2006, the USDA Forest Service issued a final directive (71 FR 29288-29301) amending FSM 2330 (Publicly Managed Recreation Opportunities) to ensure that new or reconstructed developed outdoor recreation areas on NFS lands are developed to maximize accessibility, while recognizing and protecting the unique characteristics of the natural setting. The amendment guides USDA Forest Service employees regarding compliance with the "Forest Service Outdoor Recreation Accessibility Guidelines" (FSORAG) and directs that new or reconstructed outdoor developed recreation areas in the NFS, including campgrounds, picnic areas, and outdoor recreation access routes, comply with agency guidelines and applicable Federal accessibility laws, regulations, and guidelines. The USDA Forest Service's guidelines are in two parts, the FSORAG and the "Forest Service Trail Accessibility Guidelines" (FSTAG).

California Health and Safety Code. As stipulated in Section 115825(a)-(b) of the H&SC, it is the policy of the State that multiple use should be made of all public water within the State, to the extent that multiple use is consistent with public health and public safety. Except as provided, recreational uses shall not, with respect to a reservoir in which water is stored for domestic use, include recreation in which there is bodily contact with the water by any participant. As specified in AB1144 (Harman), as signed by the Governor on September 26, 2006 and codified as Section 115755 of the Health and Safety Code, effective January 1, 2008, all new playgrounds open to the public and all playgrounds open to the public which were installed between January 1, 1994 and December 31, 1999 shall conform with national playground-related standards set by the American Society for Testing and Materials (ASTM) and the national playground-related guidelines set by the United States Consumer Product Safety Commission (CPSC), as specified.[22] All public agencies and other entities operating playgrounds open to the public shall have a playground safety inspector, certified by the National Playground Safety Institute, conduct an initial inspection for the purpose of aiding compliance with those standards.

California Government Code. As specified in Section 14670.67(a) of the CGC: "Notwithstanding any other provision of law, the Director of General Services, with the approval of the Director of Parks and

[20]/ United States Access Board, Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines, July 23, 2004.

[21]/ General Services Administration, Uniform Federal Accessibility Standards, 1984.

[22]/ AB1144 specifies that the standards shall be at least as protective as: (1) the guidelines in the "Handbook for Public Playground Safety, Publication No. 325, (United States Consumer Products Safety Commission, November 1997); (2) the "Standard Specification for Playground Equipment for Public Use" (ASTM F1487) (American Society for Testing and Materials, 2000); and (3) the "Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment" (ASTM F1951) (American Society for Testing and Materials, 1999).

Recreation and the State Public Works Board, may convey at no financial consideration to the City of Lake Elsinore, subject to an easement for flood and water storage together with any water rights the State may have in the property, and an easement to the Elsinore Valley Municipal Water District for flood and water storage together with any water rights the State may have in the property, upon those terms, conditions, and with the reservations and exceptions that the Director of General Services determines are in the best interests of the State, all the right, title, and interest of the State in that property known as the Lake Elsinore State Recreation Area upon the condition that the property be used for public park and recreation purposes in perpetuity and that park and recreation improvements conform to the Lake Elsinore State Recreation Area General Plan adopted pursuant to Section 5002.2 of the Public Resources Code and current at the time it is conveyed, except that the plan may be amended in accordance with the procedures for amendment of specific plans set forth in Article 8 (commencing with Section 65450) of Chapter 3 of Division 1 of Title 7 if duly noticed public hearings are conducted by the local public agency or agencies prior to adoption. In reviewing any amendment of that plan, the local legislative body shall consider the development criteria of Section 5019.56 of the Public Resources Code. Upon any breach of the conditions of the conveyance, the State may reenter the property, and upon that reentry, the ownership of the property conveyed shall revert to the State."

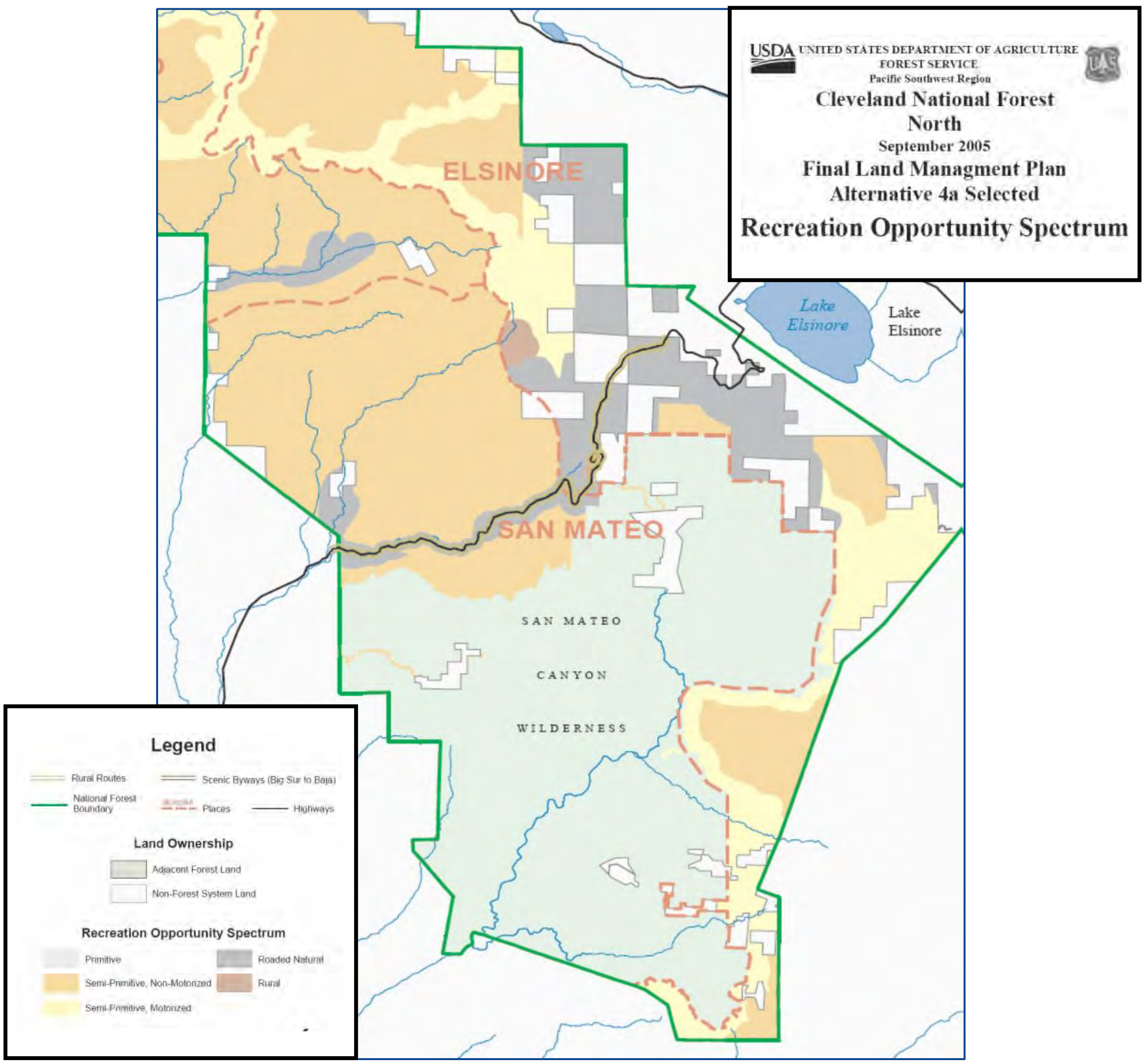

Figure E.7-1: Trabuco Ranger District – Recreational Opportunity Spectrum
Source: USDA Forest Service

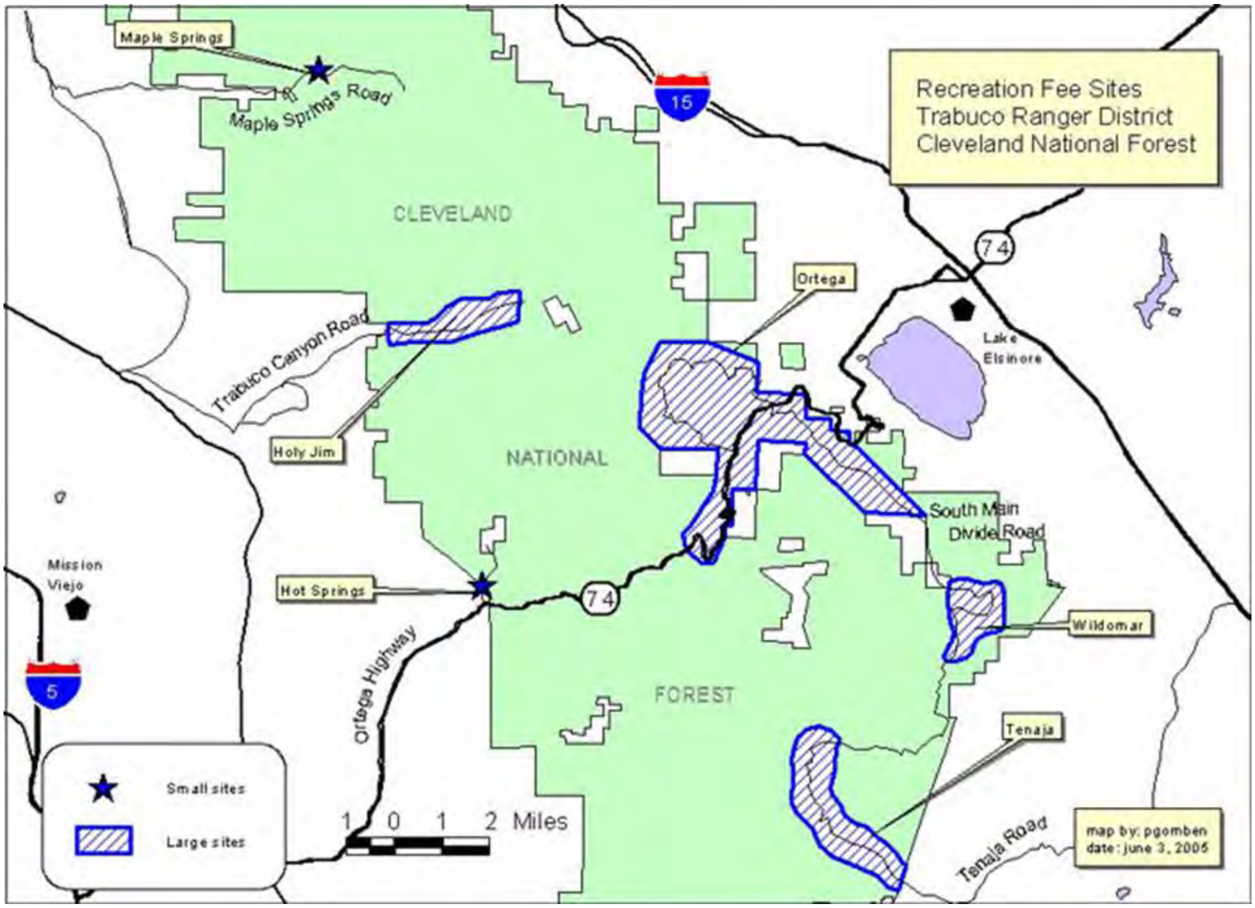

Figure E.7-2: Trabuco Ranger District - Recreation Fee Sites
Source: USDA Forest Service

ZONE	LOCATION	ACTIVITY	ZONE	LOCATION	ACTIVITY
	Lake Department Headquarters 500 W. Lakeshore Drive (951) 674-7730		RS5	Elsinore West Marina 32700 Riverside Drive	
LS1	Seaport Boat Launch 500 W. Lakeshore Drive		GS1	Crane Lakeside Park & Resort 15980 Grand Ave.	
LS2	Elm Grove Beach Lindsay St. at Lakeshore Drive		GS2	Weekend Paradise 16006 Grand Ave.	
LS3	Lowell Street Fishing Beach At Lakeshore Drive		GS3	Playland RV Park 16730 Grand Ave.	
LS4	Davis Street Fishing Beach At Lakeshore Drive		GS4	Perret Park 32938 Perret Blvd.	
LS5	Whiskers Fishing Beach Townsend St. at Lakeshore Dr.		GS5	Lakeland Marine (Boat Repair) 18010 Grand Ave.	
RS1	Lake Park Motel & RV 32000 Riverside Drive		SS1	Levee System entrance at Pete Lehr Dr & Diamond Circle.	
RS2	LERA Campground 32040 Riverside Drive		SS2	Levee System entrance at Pete Lehr Dr. & Diamond Circle.	
RS3	The Outhouse 32310 Riverside Drive		SS3	Levee System entrance at Pete Lehr Dr. & Diamond Circle.	
RS4	Roadrunner RV Park 32500 Riverside Drive		SS4	Levee System entrance at Pete Lehr Dr.& Diamond Circle.	

Figure E.7-3: Lake Elsinore Shoreline Zone Identification
Source: City of Lake Elsinore

7.3 Potential Impacts on Wilderness and Recreation

Wilderness and recreational impacts associated with the generation facilities are presented in Section 7.3.1. Wilderness and recreational impacts attributable to the primary transmission line are discussed in Section 7.3.2.

7.3.1 Potential Impacts of Pumped Storage and Generation Facilities on Recreation

Low-density residential and limited recreation-based development exists along the shoreline of Lake Elsinore. The urban setting includes recreation facilities for boating, day and overnight use, fishing access at parks, and recreational vehicle (RV) and tent campgrounds. The most important condition affecting recreation use at Lake Elsinore is the water level. Between 1992 and 1999, the surface elevation of Lake Elsinore fluctuated 40 feet, between 1229 and 1259-feet AMSL. At lake levels below 1240-feet AMSL, water quality declines substantially, impacting recreational use. At low water levels, this shallow lake's water temperature climbs, contributing to hyper-eutrophic conditions characterized by a cycle of excessive algal growth, low DO, and fish kills.

Historically, Lake Elsinore was stocked with a variety of native and non-native fish. As early as the 1890s, northern largemouth bass, green sunfish, and common carp were stocked in the lake. Through the years, often following fish kills, species of bass, bullheads, sunfish, crappies, and shad also were stocked in the lake in an effort to create a recreational fishery. The common carp, one of the first fish species planted in Lake Elsinore, is prevalent in the lake. Carp tend to be abundant in eutrophic lakes and reservoirs with silty bottoms and submerged aquatic vegetation. They are tolerant of high turbidity, high temperatures, and low DO concentrations and typically do not go below 100 feet (Moyle, 2002). The common carp is now considered a nuisance species. Following surveys in 2003, the City of Lake Elsinore implemented a carp removal program, and an estimated 291,000 carp were removed from the lake (EIP Associates, 2005).

Estimated visitor use at Lake Elsinore in 2000 was approximately 41,250 recreation visitor-days from local residents, and 177,300 visitor-days from out-of-area visitors. Trips from both groups were primarily boating-related, and only an estimated 5 to 20 percent of the use was associated with angling. Nearby, on public lands managed by the Cleveland National Forest, recreational use during 2001 was estimated at between 500,000 and 1 million visits, including an estimated 30,000 wilderness visits.

Table E.7-5 summarizes the potential wilderness and recreation impacts of the hydroelectric facilities.

Table E.7-5: Hydroelectric Facilities - Wilderness and Recreation

Impact	Description
WR-1	Construction activities would temporarily reduce access and visitation to recreation or wilderness areas.
WR-2	Presence of substation would permanently change the character of a recreation area, diminishing its recreational value.

Source: The Nevada Hydro Company, Inc.

Impact WR-1: Construction activities would temporarily reduce access and visitation to wilderness or recreation areas.

Construction activities would have temporary effects on water-based recreation activities at Lake Elsinore. At Lake Elsinore, construction activity would occur within the lake (which would serve as the lower reservoir). A cofferdam would be constructed in the lake to allow construction of the tailrace, intake/outlet structure, and other infrastructure necessary for facility operations. In-lake construction would take place over a period of about three years. Public boating access would be restricted in the vicinity of the cofferdam for public safety reasons. The boatable area lost to the navigational restriction at the inlet/outlet structure would be less than five acres. Although this impact would be adverse, based on its limited scale, it is less than significant.

No developed recreational facilities are located near construction activities that would take place at Lake Elsinore. Most of the developed recreational facilities are located on the east side of the lake, and construction activities would occur in the vicinity of the southwest portion of the shoreline. Although there would be a general increase in vehicular traffic on local roads, most construction activities would not directly affect developed recreational facilities at Lake Elsinore.

Hang gliders currently launch from various points along South Main Divide Road in the vicinity of Decker Canyon. Increased traffic on South Main Divide Road associated with construction activity at the upper reservoir may temporarily disturb the visitation of some users but impacts would be less than significant.

Since the site is privately owned, no developed or authorized recreational facilities are located in the vicinity of the proposed Powerhouse. Construction activities occurring on privately-owned lands would, therefore, not affect recreation resources or opportunities.

During construction, it would be necessary to temporarily close an area greater than the footprint of the Decker Canyon Reservoir and its associated construction staging area for public safety reasons, causing a temporary direct loss of approximately 150 acres of NFS lands. To mitigate this loss and enhance recreational opportunities in the area, the Applicant proposes to convert the Decker Canyon Reservoir staging area to a day-use area and to transfer the improved facility to the Forest Service. Because neither Decker Canyon nor its staging area are presently used for active recreational purposes (due to the lack of any improved trails and lack of accessibility to those sites), the improvements proposed by the Applicant would mitigate any potential loss of NFS lands used to create Decker Reservoir for future recreational use.

The Decker Canyon Reservoir site is located northwest of the Morgan Trail and would require no temporary or permanent re-routing of Morgan Trail. Increased traffic on South Main Divide Road and noise associated with construction of the Decker Canyon Reservoir would be apparent to visitors using the Morgan Trail. Construction traffic and noise could be limited to the reservoir's third year of construction and would be temporary. .

Impact WR-2: Presence of hydroelectric facility would permanently change the character of a recreation area, diminishing its recreational.

Because of safety considerations related to fluctuation of water depths resulting from generation and pumped storage operations, no water-related recreational activities would be provided at the proposed Decker Canyon Reservoir. The reservoir would be fenced and public access prohibited. Although no developed recreation facilities are planned in the immediate vicinity of the Decker Canyon Reservoir site, the associated construction staging area will be converted to a day-use area. Development of that facility will increase recreational uses and opportunities now available in the Decker Canyon area.

The direct effect on dispersed recreation at the Decker Canyon Reservoir site would include the loss of public access to approximately 100 acres of National Forest land that would be necessary once the reservoir was operational. This impact would be offset through the development of the proposed day-use area, as noted above.

Since the Powerhouse site is currently privately owned, no public recreational uses are authorized thereon. Once the site is developed for Project-related uses, no recreational opportunities will be lost or diminished. However, the Applicant proposes to create a neighborhood park at the site of powerhouse's construction staging area and then donate it to the City or County. The development of that facility would expand existing recreational opportunities in the Lakeland Village area and would constitute a beneficial impact.

If neither the City of Lake Elsinore nor the County of Riverside were to accept dedication of the site for park use, this proposal would be withdrawn.

Potential adverse effects on recreational fish populations from operation includes fish mortality in Lake Elsinore from entrainment (passing aquatic organisms through pump intake valves and turbines) and impingement (trapping aquatic organisms on intake screens or trash racks). Attraction flows and/or suction caused by the intakes could be too strong for some Lake Elsinore fish to escape, particularly juvenile fish with low swimming speeds, resulting in death or injury to aquatic species as they are pumped through the turbines to the upper reservoir. Fish that are entrained to the upper reservoir may not survive due to direct mortality from passage through the turbines, delayed mortality from exhaustion, suffocation, or other physical injury. Fish that may survive transport through the turbines may not survive in the upper reservoir due to a lack of habitat, forage base for food, and high reservoir fluctuations. The Applicant proposes to install appropriately spaced screens and to withdraw water at appropriate velocities in order to reduce fish-related impacts to the maximum extent feasible. Studies conducted by the Santa Ana Regional Water Quality Control Board have concluded that impacts to Lake Elsinore would be less than significant.

Project operations require assurance of the long-term availability of water in Lake Elsinore. Through a long-term purchase agreement with the EVMWD and/or other water purveyors, the Applicant will commit to the purchase of sufficient water resources for the initial filing of the upper reservoir, for make-up water resulting from evaporative losses, and for construction and environmental mitigation, thus allowing the water levels in Lake Elsinore to be maintained at a minimum water surface elevation of 1240-feet AMSL or above. Studies conducted by LESJWA have demonstrated that the stabilization of lake levels would have the greatest potential beneficial impacts to fish ecology. In addition, stabilized lake levels would improve boating opportunities and the availability of beaches for swimmers and anglers.

Daily cycling of water between Lake Elsinore and the upper reservoir during the proposed hydropower operations is expected to slightly improve water quality by increasing the level of DO in the water column (FERC FEIS, 2007). Proposed Project enhancements such as dissolved oxygen enrichment and advanced water treatment will, contribute to the long-term improvement of water quality in Lake Elsinore that would more than offset any adverse effects associated with the facility's construction and operation. Compliance with FERC and State design standards, FERC/USDA Forest Service requirements, and the conditions of a Section 401 water quality certification issued by the State Water Resources Control Board (SWRCB) would ensure that impacts would be reduced to a less than significant level and likely a net benefit achieved.

7.3.2 Potential Impacts of Primary Line and Substations on Recreation

With the proposed project reconfiguration, the primary transmission line has now been moved out of the CNF. This has completely avoided impacts to recreation in the CNF and largely avoided impacts to recreation associated with the primary transmission lines and substations at all.

As mentioned above under impacts to recreation in Lake Elsinore and Riverside County associated with the proposed pumped storage facilities, the construction of the primary transmission line is likely to result in some impact to recreational use in Lake Elsinore related to the increase in construction vehicular traffic and potentially temporary road closures or construction delays. Although with mitigation through the implementation of a traffic management plan during construction, these impacts are expected to be not significant. Impacts to recreational activities in Lee Lake are not expected to be significant due to the location of transmission line construction activities being focused further away near Alberhill.

BLUEWATER
RENEWABLE ENERGY STORAGE

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E
ENVIRONMENTAL REPORT
SECTION 8 – REPORT ON AESTHETICS RESOURCES

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

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Federal Energy Regulatory Commission
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EXHIBIT E – SECTION 8 REPORT ON AESTHETICS RESOURCES

As required under 18 CFR 4.41(f)(8), the applicant must provide a report that describes the aesthetic resources of the proposed project area, the expected impacts of the project on these resources, and the mitigation, enhancement or protection measures proposed. The report must be prepared following consultation with Federal, state, and local agencies having managerial responsibility for any part of the proposed project lands or lands abutting those lands. The report must contain:

1. A description of the aesthetic character of lands and waters directly and indirectly affected by the proposed project facilities;
2. A description of the anticipated impacts on aesthetic resources from construction activity and related equipment and material, and the subsequent presence of proposed project facilities in the landscape;
3. A description of mitigative measures proposed by the applicant, including architectural design, landscaping, and other reasonable treatment to be given project works to preserve and enhance aesthetic and related resources during construction and operation of proposed project facilities; and
4. Maps, drawings and photographs sufficient to provide an understanding of the information required under this paragraph. Maps or drawings may be consolidated with other maps or drawings required in this exhibit and must conform to the specifications of §4.39.

8.0 REPORT ON AESTHETICS RESOURCES

8.1 Aesthetics Environmental Setting

The Lake Elsinore area lies on the eastern edge of the Elsinore Mountains, the southern extension of the Santa Ana Mountain range in southern California. Figure E.8-1 shows the general locations described herein. These mountains rise above the coastal foothills east of the cities of Mission Viejo and San Juan Capistrano, reaching a peak of 3,500 feet (Elsinore Peak) near the Project and then abruptly descending to Lake Elsinore (long-term lake elevation between 1240-1249 feet above mean sea level [amsl]), a depression in the geologic landscape between the Santa Ana-Elsinore coastal range and the inland hills. The landscape character of this area can be characterized by two general descriptions: The mountainous zone and the Lake Elsinore zone.

Aerial photographs of Lake Elsinore and proposed facility sites such as the Santa Rosa Substation, Project Powerhouse, and Decker Canyon Reservoir are presented in Figure E.8-2.

The "mountain zone," the majority of which consists of National Forest Service lands (NFS or Forest Service), provides a natural area with limited development surrounded by densely populated, urbanized areas. The mountainous landscape of ridges cut by intermittent streams is covered mostly with chaparral vegetation, and the low-lying streambed areas are populated with riparian and oak woodland type communities. The short wet season followed by a lengthy warm and dry season dictate the colors and textures of the plants and hillsides within the mountainous zone.

Existing residences located along and adjacent to South Main Divide Road are generally hidden from public view. Throughout the mountainous zone, intermittent streams, occasional springs, exposed rock outcrops, spring wildflowers, pockets of oak-pine woodland, and dense chaparral are common. Colors in this area vary from tans, browns, golds, grays and dull greens in the summer to bright greens and patches of flowers in the late winter/early spring mixed with the sandstone hardscape.

The "lake zone" comprises the areas around Lake Elsinore, including the unincorporated area of Lakeland Village (Cleveland Ridge), situated along the I-15 Freeway corridor and between the I-15 Freeway to the north and east and the "mountain zone" to the south and west. The local landscape is characterized by residential, commercial, some light industrial and mining operations surrounding Lake Elsinore, interspersed with patches of non-native grasslands and bare ground. Light colored buildings, darker asphalt roadways, and planted landscapes are major elements in the urban color scheme and texture typical of southern California, although the overall color scheme highlights the neutral colors (e.g., beige, tan, sandstones, some greens, and interspersed red tile). The larger viewscape from this zone includes the east slope of the Santa Ana and Elsinore Mountains up to the ridgeline of the "mountain zone." The mountains are the dominant feature of the distant visual landscape while Lake Elsinore, where visible, is the dominant feature of this visual landscape. At times from the "lake zone," both the lake and mountains are visible, making for a striking aesthetic setting of the steep mountains descending into Lake Elsinore. The proposed Santa Rosa Substation, Powerhouse, and primary transmission line would be within this zone.

8.1.1 USDA Forest Service Scenery Management System

The USDA Forest Service's "Scenery Management System" provides a framework for the inventory and analysis of the aesthetic values on NFS lands and is a tool for integrating the benefits, values, desires, and preferences regarding aesthetics and scenery for all levels of land management planning. Scenic Integrity Objectives (SIOs) have been designated for all areas of the National Forest. At the project level, National Forest activities are subject to review of the SIOs. SIOs are the objectives that define the minimum level to which landscapes are to be managed from an aesthetics standpoint. The Forest Plan assigns the following five SIOs to lands within the CNF: "Very High," "High," "Moderate," "Low," and "Very Low."

The Scenic Integrity Objectives (SIOs) that most directly apply to the Project area are described in Table E.8-1. The locations of the various SIO designations for lands within the Project area are shown in Table E.8-2, Figure E.8-5.

The USDA Forest Service's SIOs for those NFS lands upon which the generation facilities are proposed are primarily designated "High." Segments of the proposed primary transmission line traverse areas designed "High" and "Moderate." Table E.8-1 identifies the SIOs by Project facility.

Table E.8-1: Description of Scenic Integrity Objective Designations for National Forest Lands

SIO Designation	Definition
Very High	This classification generally provides for ecological changes only. This refers to landscapes where the valued (desired) landscape character is intact with only minute, if any, deviations. The existing landscape character and sense of place is expressed at the highest possible level. The landscape is unaltered. This is synonymous with the Preservation Visual Quality Objective under the original Visual Management Plan.
High	This classification provides for conditions where human conditions are not visually evident. This refers to the valued (desired) landscape character "appears" intact. Deviations may be present but must repeat form, line, color, texture, pattern, and scale common to the characteristic landscape. The landscape appears unaltered. This is synonymous with the Retention Visual Quality Objective under the original Visual Management System.
Moderate	This classification refers to landscapes where the valued (desired) landscape characters "appears slightly altered." Noticeable deviations must remain subordinate to the landscape character being viewed. The landscape appears slightly altered. This is synonymous with the Partial Retention Visual Quality Objective under the original Visual Management System.
Low	This classification refers to landscapes where the valued (desired) landscape characters "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes such as size, shape, edge, effect, and pattern of natural openings, vegetative-type changes or architectural styles outside the landscape being viewed. Deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition. The landscape appears moderately altered. This is synonymous with the Modification Visual Quality Objective under the original Visual Management System.

Source: USDA Forest Service

Table E.8-2: Scenic Integrity Objective Designations within the Project Area

Project Facilities	SIO Designation
Decker Canyon Reservoir	The SIO for Decker Canyon area is "High." The San Mateo Canyon Wilderness is "Very High."
Primary Transmission Line	The SIO for this area is designated "High."
Santa Rosa Substation and Powerhouse	The proposed Santa Rosa Substation and Powerhouse sites are located on private lands located with in the National Forest and are, therefore, outside the USDA Forest Service jurisdiction with regard to SIOs.

Source: The Nevada Hydro Company

In addition to the SIOs, the Forest Plan emphasizes place-based programs and goals and considers visual character and quality of an area as key attributes. A portion of the Project would be located within "Elsinore Place," described in the Forest Plan as "one of the most visible landscapes on the national forest and is maintained as an undeveloped island in the rapidly developing southern Riverside County and a natural appearing urban backdrop to the Interstate 15 corridor. The valued landscape attributes to be preserved over time are the undeveloped quality and character of the urban backdrop, including the natural appearing skyline silhouette of the Santa Ana Mountains, and the scenic integrity of areas visible from the Interstate 15 and Ortega Highway corridors."

SIOs constitute the "objectives that define the minimum level to which landscapes are to be managed from an aesthetic standpoint."[1] As further indicated in the Forest Plan, the following aesthetic management standards have been identified: (1) "Design management activities to meet the Scenic Integrity Objectives (SIOs) shown on the Scenic Integrity Objectives Map"; and (2) Scenic Integrity Objectives will be met with the following exceptions: [a] Minor adjustments not to exceed a drop of one SIO level is allowable with the Forest Supervisor's approval; [b] Temporary drops of more than one SIO level may be made during and immediately following project implementation provided they do not exceed three years in duration."[2]

1/ United States Department of Agriculture, Forest Service, Land Management Plan – Part 3 Design Criteria for Southern California National Forests: Angeles National Forest, Cleveland National Forest, Los Padres National Forest, San Bernardino National Forest, R5-MB-080, p. 113.

2/ Land Management Plan – Part 3 Design Criteria for Southern California National Forests: Angeles National Forest, Cleveland National Forest, Los Padres National Forest, San Bernardino National Forest, R5-MB-080, p. 6.

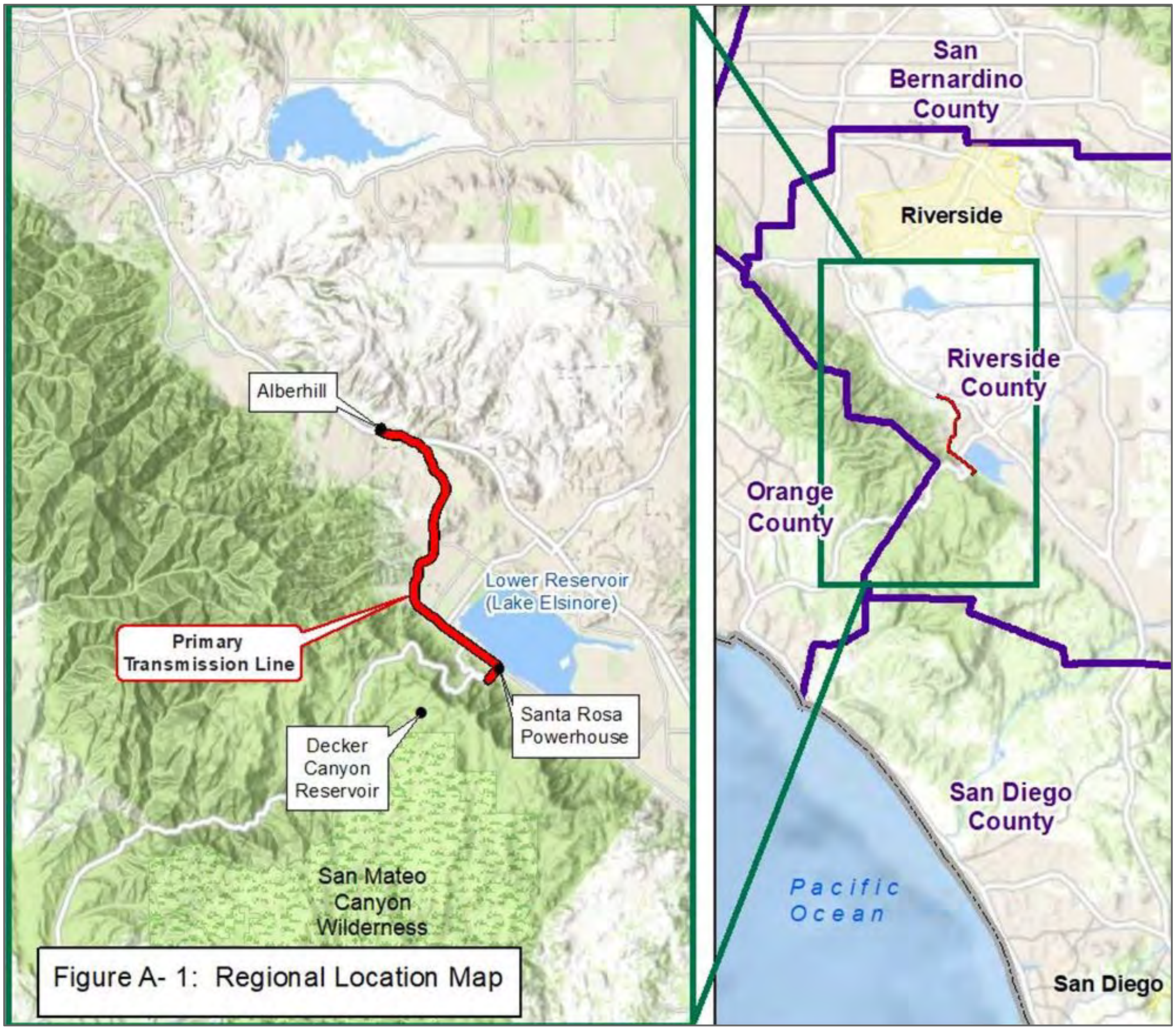

Figure E.8-1: Regional Vicinity Map

Figure E.8-2: Aerial Photographs (1 of 3) Lake Elsinore and Vicinity
Source: Natural Resource Conservation Service

Figure E.8-3: Aerial Photographs (2 of 3) Proposed Santa Rosa Substation and Powerhouse and Vicinity
Source: Natural Resource Conservation Service

Figure E.8-4: Aerial Photographs (3 of 3) Proposed Decker Canyon Reservoir and Vicinity
Source: Natural Resource Conservation Service

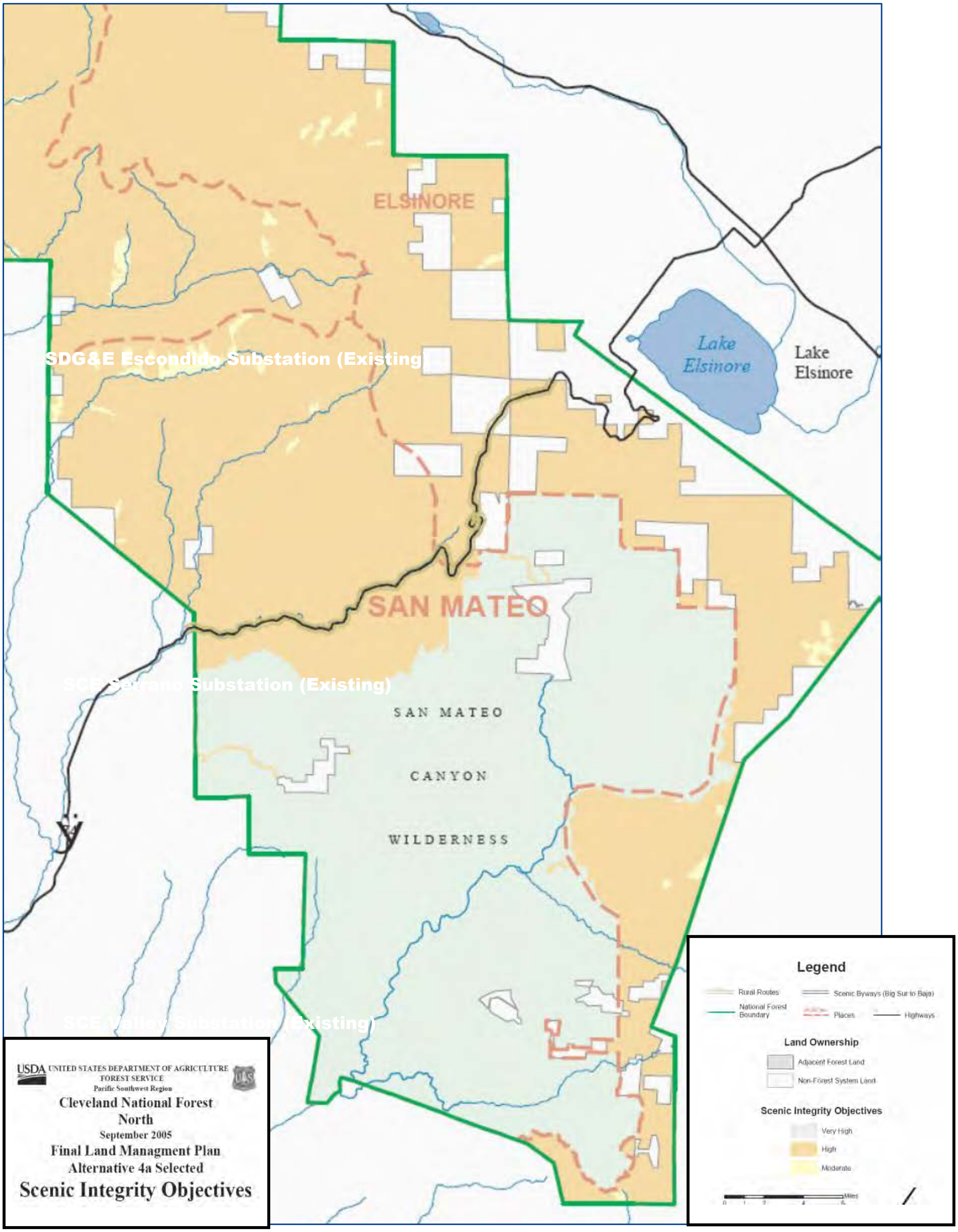

Figure E.8-5: Trabuco Ranger District Scenic Integrity Objectives
Source: USDA Forest Service, as modified

8.2 Existing Site-Specific Aesthetics

Proposed Project facility sites are individually described below.

8.2.1 Decker Canyon Reservoir Site and Construction Laydown Areas.

The proposed Decker Canyon Reservoir site is in the headwaters of the San Juan Creek Watershed.

The view of Decker Canyon from South Main Divide road entirely comprises chaparral-chamise vegetation communities. The construction laydown area would be on the east side of South Main Divide Road in an area that is currently partially barren and used for the launching of hang gliders. Maximum viewable distances of Decker Canyon from South Main Divide Road terminate at interior mountains higher than the view point in the San Mateo Wilderness about 0.5 mile away. A portion of the view from the top of Decker Canyon extends northwest toward the confluence of Decker and San Juan Creek Canyons about 5 miles away; however, vegetation, canyon topography, and at times, atmospheric haze largely obstruct the view. Views from the construction laydown area to the east overlook Lake Elsinore, the I-15 corridor, and (depending on the amount of haze in the air) beyond to more mountain ridges on the horizon.

The SIO designation for the proposed Decker Canyon Reservoir site and the construction laydown areas is “High” based on the naturally appearing landscape. Human-made alterations exist (e.g., South Main Divide Road, Morgan Trailhead, some residential houses on private in-holdings within the National Forest); however, the scale of these features is not out of context for the landscape, and the overall sense of the landscape, when viewed from South Main Divide Road, is that it is mostly unaltered.

8.2.2 Santa Rosa Substation and Powerhouse.

The proposed Santa Rosa Substation and the proposed Powerhouse sites are located at the base of the mountains within the CNF’s boundary southwest of Grand Avenue in the unincorporated area of Lakeland Village (Riverside County). These parcels are private in-holdings and do not have SIO designations.

The land uses along Grand Avenue dictate the aesthetic feel of the area, which includes single-family and multi-family residences, small commercial establishments, and vacant property. The parcel associated with the proposed Santa Rosa Substation and Powerhouse consists primarily of non-native grasses with occasional shrubs, bare land, and numerous trails or dirt roads traversing the area. Unique features visible from this parcel (other than the neighboring residences) include the mountains to the southwest and southeast and partial views of Lake Elsinore, where visible, to the north.

The general character of this parcel is considered open space within an urban environment. This characterization is derived from the parcel’s fairly large size and lack of development; however, it is surrounded by the urbanized areas of Lakeland Village and is subject to informal recreation uses (numerous dirt trails and roads traversing the parcel and visual evidence of illegal dumping). The landscape and visual aesthetics of this site are not unusual, but they are accentuated by the parcel’s proximity to the mountains and the striking backdrop they provide to all parcels along Grand Avenue.

Views of the foreground (0 to 0.5 miles) and middle ground (0.5 to 5 miles) to the southeast and southwest from the proposed Santa Rosa Substation and LEAPS Powerhouse site look directly at the base of the Santa Ana and Elsinore Mountains and up to the ridge line. Dependent upon the particular vantage point, the viewable distances to the north and east is generally obscured by residential influences and, except at higher elevations, are not more than 0 to 0.5 mile in total distance.

8.2.3 Primary Transmission Line Alignment.

The primary transmission line alignment is located within the City of Lake Elsinore and unincorporated Riverside County. The transmission alignment would parallel existing roads and other existing linear infrastructure includes Grand Ave, Lake Ave and Temescal Canyon Road. The area can be generally described as urban areas around Lake Elsinore and along the I-15 Freeway corridor.

8.3 Key Viewpoints Associated with the Proposed Project

Many of the features associated with the Proposed Project would be visible from public travelways that adjoin the Project site. Changes to the landscape would be most visible to the public who use South Main Divide Road, Ortega Highway, and Grand Avenue and neighboring communities. Other important areas with views of the Proposed Project features would include the surface of Lake Elsinore, Wildomar Road, Morgan Trail, and the I-15 Freeway. Viewpoint simulations are available below.

Presented below is a discussion of a number of key viewpoints.

South Main Divide and Wildomar Roads. South Main Divide Road is a two-lane, paved, Riverside County-maintained road popular with scenic drivers and provides access to in-holdings and National Forest facilities. South Main Divide Road winds across the ridge of the mountains, allowing views of Lake Elsinore and beyond from various points along the roadway Figure E.8-8 and Figure E.8-11 show the roads in proximity to the top of the ridgeline and views to the north and south. Where the views are limited by vegetation and local topography, the natural environment dominates the viewscape with residential driveways, gates, and fences interspersed.

Wildomar Road is a USDA Forest Service road that extends across NFS lands to the south of South Main Divide Road and provides access to the Wildomar Campground and Off-Highway Vehicle (OHV) Area. With the exception of communication towers on Elsinore Peak and the OHV use areas that exhibit disturbances to the vegetation, views from this road are dominated by the mostly naturally appearing landscape.

State Route 74. Ortega Highway is a two-lane, paved, State highway connecting Riverside and Orange Counties. This heavily traveled route is popular for scenic driving as well as commuting and is eligible for designation as a State Scenic Highway. Travel speeds on Ortega Highway play a strong role in the ability of motorists to view details in the surroundings landscape as traffic flow is typically in the 45 to 55 mile per hour (mph) range (posted speed limits may be less). Further limiting the views from Ortega Highway, west of South Main Divide, are the numerous turns, vegetation, and steep canyon walls on both sides of the road as the highway nears the crest. East of South Main Divide Road, the landscape views open up as the highway descends the mountains with numerous vistas of Lake Elsinore and beyond.

Lake Elsinore Area. Boaters on Lake Elsinore are afforded 360 degree views of the lake in the near ground and the mountains in in the distance. Grand Avenue is in an area of existing urban (residential and commercial) development and carries a significant amount of local traffic near the proposed Santa Rosa Substation and Powerhouse. Views from here are predominantly residential with the mountains rising in the background to the southwest and Lake Elsinore, when visible through open spaces between houses and vegetation, to the northeast.

I-15 Freeway. The I-15 (Corona and Escondido) Freeway is a Federal interstate highway located less than 1 mile at its closest point (to the northeast of Lake Elsinore) and receives heavy commercial and non-commercial use. Similar to views from the water and eastern shore of Lake Elsinore, the most visible non-natural feature on the mountains (looking southwest) is the Ortega Highway road cut rising from the southwestern shoreline of Lake Elsinore across the mountain face. It is about 4.5 miles from the I-15 Freeway to the pass where Ortega Highway crosses the mountains. The distance from the I-15 Freeway to the Ortega Highway reduces the effect as the mountains are striking and dominant compared to Ortega Highway. Depending on where the observer is on the interstate and the season, the ability to identify non-natural details on the mountains from the I-15 Freeway is further reduced by local topography and atmospheric haze.

Scenic resources within and surrounding the City of Lake Elsinore include the lake, CNF, rugged hills, mountains, ridgelines, rocky outcroppings, streams, vacant land with native vegetation, buildings of historic and cultural significance such as the cultural center, bathhouse and military academy, parts, and trails.[3] "*For purposes of discussion, 15 landscape viewshed units have been identified in the Lake Elsinore area. . .Each of these areas has distinct viewsheds defined by man-made structures and physiographical features such as landform, water, or cultural features*."[4]

The following brief description is provided with regards to each of the "landscape viewshed units" illustrated in Figure E.8-6: (1) Mainly vacant land with steep hillsides interspersed with development; unit is both within the City and Sphere of Influence (SOI); (2) Partially graded land due to mineral extraction; unit is half in the City and half in the SOI; (3) Mainly developed with residential, commercial, and recreational land uses; (4) Steep slopes mainly outside City boundaries, but within the SOI; includes portions of the CNF; this unit is mainly undeveloped, but has patches of residential, commercial, and recreational development; (5) Rolling hillsides characterize this unit; it is mainly residential with limited commercial use; (6) Unit is adjacent to the lake with a mix of residential, commercial, and public facilities; this unit is also the location of historic downtown Lake Elsinore; (7) Mainly within City boundaries, the unit is characterized by varying topography and rural development; (8) Majority of this unit is outside City boundaries, but within the SOI; area is developed with intermittent residential and commercial uses; (9) Unit is outside of the City but within SOI; residential community located along I-15 Freeway; (10) Located outside the City and on the edge of the SOI; characterized by rolling hills with limited residential development; (11) Located in the center of the SOI; mainly developed with residential and commercial uses; contains a public high school; (12) Location of the future Lake Elsinore Outlet stores; large portion to the east is vacant for future expansion; (13) Mainly manufacturing land located along I-15 Freeway; relatively flat topography; includes current location for the existing Lake Elsinore Outlet Mall; (14) This unit includes Lake Elsinore and surrounding floodplain; and (15) Characterized by steep slopes and limited development due to small lots and inadequate utilities; also known as County Club Heights.[5]

The City's "Background Report," which included consideration of a similar project in the Project No. 11858 proceeding, includes the following discussion of the LEAPS generation facilities: *"The Lake Elsinore Advanced Pumped Storage Project as proposed by EVMWD [Elsinore Valley Municipal Water District] has the potential to affect visual resources around the lake. The proposal includes filling up one of two canyons as a lake reservoir at the top of the Santa Ana mountain range, and includes an underground powerhouse at the bottom of the mountains. A two or three story building is proposed to be located on the top of the powerhouse. The pipes that carry the water will be tunneled through the mountain connecting the reservoir with the lake. This will likely not affect visual conditions because instead of trenching the pipes, a boring machine will be used to go through the mountain. Implementation of the project will likely affect the visual resources of the LEAPS project area, but Federal NEPA and State CEQA processes are still in motion and the final proposal is still to be determined."*[6]

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[3]/ City of Lake Elsinore (Mooney-Jones & Stokes), City of Lake Elsinore General Plan, Background Reports, Aesthetic and Visual Resources Background Report, January 2006, p. 9-3.

[4]/ *Id*., p. 9-3.

[5]/ Ibid., pp. 9-3 and 9-4.

[6]/ Ibid., p. 9-8.

8.4 Aesthetics Regulatory Setting

The following information presents a general discussion of certain State and Federal statutes and regulations most applicable to an understanding of the Project's statutory and regulatory setting.

California Public Resources Code. In accordance with Section 21000(b) of Public Resources Code (PRC), "[i]t is necessary to provide a high-quality environment that at all times is healthful and pleasing to the senses and intellect of man." Pursuant to Section 21001(b) of CEQA, it is the policy of the State to "[t]ake all actions necessary to provide the people of this State with clean air and water, enjoyment of aesthetics, natural, scenic, and historic environmental qualities, and freedom from excessive noise."

California Street and Highway Code. The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the California Streets and Highways Code (S&HC). The status of a State Scenic Highway changes from "eligible" to officially "designated" when the local jurisdiction adopts a scenic corridor protection program, applies to the California Department of Transportation (Caltrans) for scenic highway approval, and receives notification from Caltrans that the highway has been designated as a scenic highway.

Only that portion of SR-74 (Ortega Highway) between the west boundary of the San Bernardino National Forest (SBNF) westward to State Route-111 in the City of Palm Desert has been officially designated as a State Scenic Highway. SR-74 from the west boundary of the SBNF eastward to SR-1 is identified as an "eligible State Scenic Highway – Not Officially Designated." As indicated in Caltrans' "Guidelines for the Official Designation of Scenic Highways," "power lines" are identified as an "unsightly land use."[7] As indicated in the "County of Riverside Comprehensive General Plan" (Elsinore Area Plan), both the I-15 Freeway and SR-74 are designated as "State eligible scenic highways."[8] Neither the I-15 Freeway nor that portion of Ortega Highway located in the general Project area are designated as State Scenic Highways by Caltrans.

California Public Utilities Code. The California Public Utilities Code (CPUC) prohibits new overhead utility distribution installation in scenic highway corridors and requires the CPUC to regulate approved work (Section 320). Section 320 does not apply to transmission towers, conductors, or related facilities designed to operate at high-side voltages of 50 kV or more, unless the utility designates them as distribution lines.

Riverside County Ordinance No. 655 restricts the permitted use of certain light fixtures emitting into the night sky undesirable light rays that may have a detrimental effect on astronomical observations. Ordinance No. 655 defines lighting sources, establishes the type and manner of installation and operation of lighting, and details lighting prohibitions.

[7]/ California Department of Transportation, Guidelines for the Official Designation of Scenic Highways, March 1996.

[8]/ County of Riverside, County of Riverside General Plan, Elsinore Area Plan, Figure 9, October 7, 2003.

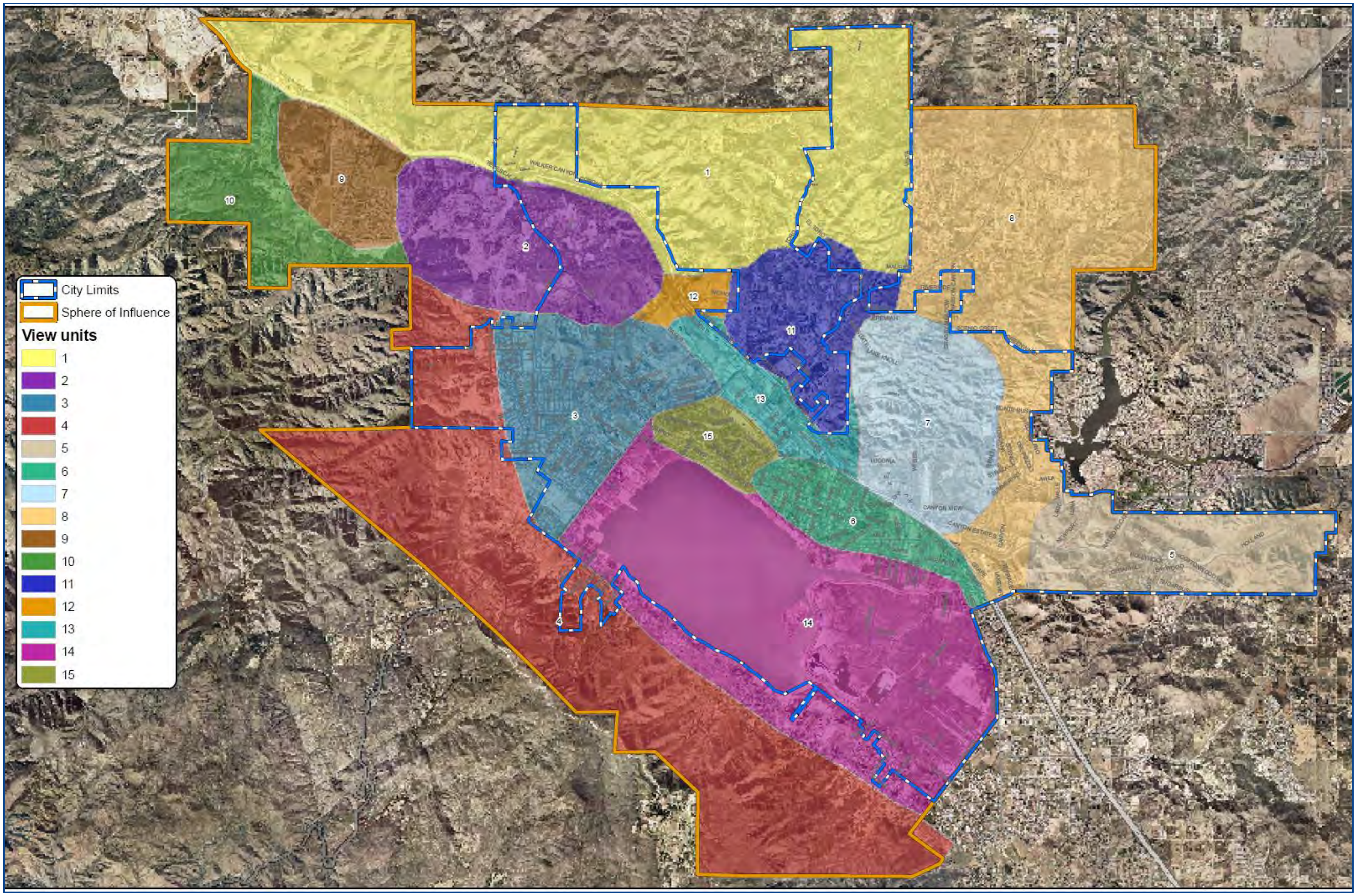

Figure E.8-6: City of Lake Elsinore Landscape Viewshed Units
Source: City of Lake Elsinore (Mooney – Jones and Stokes)

8.5 Aesthetic Impact Analysis

Visual Resource impacts associated with LEAPS generation facilities are presented in Section 8.5.1. Impacts on visual resources attributable to the primary transmission lines and the Lake and Case Springs Substations are discussed in Section 8.5.2. Potential cumulative impacts on visual resources relating to the Project (inclusive of both primary transmission lines and generation) are presented in Section 8.5.3.

8.5.1 Potential Impacts of the Pumped Hydro Storage Facilities

Analysis of visual resources impacts of generation facilities are described below. Visual impacts related to the generation facilities would be similar for all areas where generation-related facilities are located (i.e., Santa Rosa Substation, Powerhouse, intake/outlet structures), except Decker Canyon, and the analysis and descriptions for key viewpoints (KVP) L1, L2, L4, L6, L7, and L8 are provided below. Because an open surface water reservoir would be constructed and operated at Decker Canyon near the crest of the Santa Ana (Elsinore) Mountains and south of South Main Divide Road, visual impacts for KVPs L3 and L5 would be different compared to visual impacts for the generation facilities and the primary transmission lines, and KVP L10 would show a unique view of the proposed upper reservoir. Also, at the foot of the Elsinore Mountains, there would be a new Powerhouse visible from Grand Avenue (KVP L9). Key viewpoints are shown on Figure E.8-7.

Project generation facilities include the new Decker Canyon Reservoir, new Powerhouse, Santa Rosa Substation, construction laydown areas, and electrical and water conduits including power shafts, power tunnel, penstocks, tailrace tunnels, and an inlet/outlet structure. The proposed Decker Canyon Reservoir site is located on NFS lands; however, all or portions of the Powerhouse, Santa Rosa Substation, and associated electrical and water conduits extending between the upper reservoir and the powerhouse are located on privately-owned lands located within the boundaries of the CNF (i.e., inholdings). The National Forest is almost entirely surrounded by urban development and serves as a scenic backdrop valued as an important open space and visual resource.

The SIO for the lands where the proposed upper reservoir and its associated construction staging areas would be located is designated by the USDA Forest Service as having a High SIO based on the public preferences for natural-appearing landscapes. The San Mateo Canyon Wilderness, located approximately 0.5 miles from the upper reservoir site, is designated as having a Very High SIO and only ecological changes are allowed within the wilderness.

The view of Decker Canyon from South Main Divide Road consists of riparian vegetation in the canyon bottom surrounded by mountain tops with chamise-dominated chaparral vegetation and rock outcroppings. The construction staging area would be on the north side of South Main Divide Road in an area that is currently partly barren and used, in part, for the launching of hang gliders. Maximum viewable distances across Decker Canyon from South Main Divide Road is limited where topography abutting and proximal to that roadway, within the National Forest and within the San Mateo Canyon Wilderness (about 0.5 miles away), exceed that of the proposed reservoir area. A portion of the view from the top of Decker Canyon extends southwest toward the confluence of Decker and San Juan Creek Canyons about five miles away; however, vegetation, canyon topography, and at times, atmospheric haze largely obstructs the view. Portions of Decker Canyon, including the area of the proposed downstream dam face, are visible from short portions of Ortega Highway.

Because the Powerhouse site would be situated on privately owned parcels within the boundaries of the CNF but outside of USDA Forest Serivice jurisdiction, a SIO is not designated for the powerhouse site. The land uses along Grand Avenue dictate the aesthetic feel of the powerhouse site area, which includes single-family residences, small commercial establishments, multi-family residential development, a school site, and vacant property. The proposed Powerhouse site consists primarily of non-native grasses with occasional shrubs, bare land, and numerous trails or dirt roads traversing the area. The general character of this area is edge-oriented open space within an urbanized environment. This characterization is derived from the property's fairly large size and intensity of adjoining development. The site is however, surrounded on the north, east, and west by the urbanized areas of Lakeland Village and is subject to informal recreation uses (numerous dirt trails and roads traversing the parcel) and visual evidence of illegal dumping. The landscape and visual aesthetics of this site are not unusual, but they are accentuated by the properties' proximity to the mountains and the backdrop that the Elsinore Montains provide to all parcels along Grand Avenue (*see* FERC EIS, 2007).

KVP L3: South Main Divide Road near Decker Canyon Reservoir. As illustrated in Figure E.8-8 KVP L3 was established on the South Main Divide Road looking southeast, near where the primary transmission lines would leave the Lake Elsinore viewshed and cross over into the San Mateo Canyon Wilderness viewshed. The existing visual quality is high in this area, with the only visible deviations being South Main Divide Road and the Elsinore Peak Electronic Site on the skyline to the left. Landforms are gently rolling mountains with a predominance of horizontal lines on ridge tops and the skyline. Vegetation is low growing chemise and chaparral with only small clumps of trees scattered in ravines. Granitic rock outcrops add visual interest to the skyline of San Mateo Canyon Wilderness in the background and one foreground rock outcrop. This scene has high existing scenic integrity, and the USDA Forest Service has designated this entire area as having a Very High SIO inside the wilderness and a High SIO outside the wilderness boundary.

KVP L5: Ortega Highway. As illustrated in Figure E.8-9, KVP L5 was established along Ortega Highway looking northeast up Decker Canyon to the South Main Divide Road and the skyline near the proposed Decker Canyon Reservoir site. Like KVPs L3 and L4, the existing visual quality is high in this area, with the only visible deviations being the Forest Adventure Pass parking area along Ortega Highway in the immediate foreground and the South Main Divide Road cut slopes in the middle ground. Landforms are gently rolling mountains with a predominance of horizontal lines on the skyline in the middle ground. Small rock outcrops are evident in the middle ground, adding visual variety to this intact scene. This scene has high existing scenic integrity, and the USDA Forest Service has designated this entire area as having a Very High SIO inside the wilderness and a High SIO outside the wilderness boundary.

KVP L9: Grand Avenue. As illustrated in Figure E.8-10, KVP L9 was established on Grand Avenue in the City of Lake Elsinore. Views perpendicular to the road, looking southwest, reveal a relatively flat, open space leading to the foot of the Elsinore Mountains in the CNF. Just northwest of this site, along Grand Avenue, are two multi-family residential complexes, Butterfield Elementary Visual and Performing Arts Magnet School, and the Ortega Trails Youth Center, all on the same side of the street. Continuing south on Grand Avenue, there are scattered single-family residences.

The Santa Rosa Substation is proposed to be constructed in the middle of this photograph. The entire site would be surrounded by an 8 to 10-foot-high concrete block wall and would be visible with foreground detail.

Visual Quality (Moderate). The foreground, with its relatively level plain and scattered trees, has minimal visual quality, but, when taken in context with the mountains in the middle ground, the overall visual quality is moderate. Predominant colors are brown and tan soils and gray-green to dark-green vegetation. Rockforms are non-distinctive and water is lacking. Horizontal lines of the existing electric subtransmission system are present in this view, as are derelict fencing and roadside litter, resulting in an overall moderate visual quality.

Viewer Concern (Moderate). Travelers on Grand Avenue, and also viewers at the apartment complex (Santa Rosa Mountain Villa Apartments) and elementary school, are provided with distinct mountain views as they pass this property. Although there are some commercial land uses along Grand Avenue, the neighborhood is primarily residential in nature and any addition of industrial character to the predominantly natural appearing landscape or blockage of views to more valued landscape features (open space and mountain slopes) would be seen as an adverse visual change.

Viewer Exposure (High). There is no vegetative or topographic screening for the proposed Santa Rosa Substation, and viewing distances allow details to be seen in the foreground and context to be evaluated against the middle ground mountainside, resulting in high visibility. Viewing times are brief for travelers on Grand Avenue but are extended for residents located along Grand Avenue and at the elementary school, and for pedestrians walking along Grand Avenue. The number of viewers would be moderate and the duration of view would be brief for travelers on Grand Avenue and extended for residents and school children. Consequently, viewer exposure is high.

Overall Visual Sensitivity (Moderate-to-High). For travelers on Grand Avenue and residents/school children in the neighborhood in the vicinity of the Santa Rosa Substation, combining the moderate visual quality, low-to-moderate viewer concern, and high viewer exposure leads to a moderate-to-high overall visual sensitivity of the visual setting and viewing characteristics.

KVP L10: South Main Divide Road near Decker Canyon Reservoir. As illustrated in Figure E.8-11, KVP L10 was established on South Main Divide Road looking south, adjacent to where the Decker Canyon Reservoir would be located. The existing visual quality is high in this area, with the only visible deviation being South Main Divide Road. Landforms are gently rolling mountains with a predominance of horizontal lines on ridge tops and the skyline. Vegetation is low growing chemise and chaparral with only small clumps of trees scattered in ravines. Granitic rock outcrops add visual interest. This scene has high existing scenic integrity and the USDA Forest Service has designated this area as having a Very High SIO (inside the San Mateo Canyon Wilderness) and a High SIO (outside the San Mateo Canyon Wilderness).

Potential visual resource impacts associated with the generation facilities are summarized in Table E.8-3. Proposed protection, mitigation, and enhancement measures (PME) will serve to mitigate potential visual resource impacts attributable to the generation components of the proposed hydropower project are presented in Table E.8-4.

Table E.8-3: Project Visual Resource Impacts

Impact	Description
VR-11	Construction of reservoir and associated facilities on National Forest System lands would cause medium-term visibility of construction activities, equipment, and night lighting and an increase in industrial character.
VR-12	Short-term visibility of construction activities, equipment and night lighting associated with construction of the project.
VR-13	Introduction of structure contrast and industrial character associated with the LEAPS Powerhouse, when viewed from Key Viewpoint L9 on Grand Avenue.
VR-14	Inconsistency with the USFS Scenic Integrity Objective due to long-term visibility of a non-natural landscape feature (reservoir facilities) from Key Viewpoints L3 and L10, on South Main Divide Road and from Key Viewpoint L5, Ortega Highway.

Source: The Nevada Hydro Company, Inc.

Table E.8-4: PMEs - Visual Resource Impacts

Measure	Description
VR-1	Prepare and implement a scenery conservation plan to achieve the greatest consistency possible with the High Scenic Integrity Objectives of the Cleveland National Forest Land Management Plan.
VR-2	Develop and implement a transmission tower placement plan (Complete).
VR-3	Prepare a plan to avoid or minimize disturbances to the quality of the existing visual resources of the project area.

Source: The Nevada Hydro Company, Inc.

Impact VR-11: Construction of reservoir and associated facilities on National Forest System lands would cause medium-term visibility of construction activities, equipment, and night lighting and an increase in industrial character.

Construction of the proposed upper reservoir, staging area, and associated structures would directly affect approximately 150 acres of lands and would require approximately three million cubic yards of earthwork. Excavation of the water conduit tunnels would likely result in the placement of earthen materials at the staging area near the LEAPS Powerhouse, changing the topography of lands located along Grand Avenue. The upper reservoir construction activities would be limited to a single canyon in the CNF.

Construction would entail using vehicles, trailers, equipment, materials, laborers, earthen debris, and fencing along South Main Divide Road. The area would be de-vegetated, re-graded, leveled, barricaded, lined, and filled. If revegetated after construction, the effects from construction on visual resources of the area would last for up to three years.

Upon the completion of construction, the USDA Forest Service has indicated that this construction laydown area should be converted to a day-use area. No plans or formal direction for that facility have been formulated or provided by the USDA Forest Service. The site will be graded and landscaped by the Applicant in accordance with a recreational development plan to be formulated by the Applicant in consultation with the USDA Forest Service and should be considered as a PME.

With regard to the proposed upper reservoir, construction activity, while isolated to the single canyon, would be a condition where human alterations would be extremely visually evident from the San Mateo Canyon Wilderness and segments of South Main Divide Road, which would be inconsistent with the High SIO set by CNF for this area. Night and security lighting impacts during construction could occur if lighting at construction and storage yards and staging areas is not appropriately controlled.

Visual impacts from construction of the proposed upper reservoir on NFS lands would likely be significant (Class I) due to the large scale and duration of construction activities.

Proposed PMEs to Address Impact VR-11

In order to mitigate any residual aesthetic resource impacts caused by the construction and operation of the Proposed Project and to enhance aesthetic resources, the Applicant proposes the following PMEs:

- Reduce visibility of construction activities and equipment. Substation construction sites and all staging and material and equipment storage areas, including storage sites for excavated materials, and helicopter fly yards shall, to the extent feasible, be located away from areas of high public visibility. If visible from nearby roads, residences, public gathering areas, or recreational areas, facilities, or trails, construction sites and staging areas and fly yards shall be visually screened using temporary screening fencing. Fencing will be of an appropriate design and color for each specific location. The Applicant shall submit final construction plans demonstrating compliance with this measure to the CPUC, USDA Forest Service (on NFS lands), and other agencies with jurisdiction over the project (as applicable) at least 60 days prior to the start of construction. (VR–11a)

- Reduce construction night lighting impacts. The Applicant shall design and install all lighting at construction and storage yards and staging areas and fly yards such that light bulbs and reflectors are not visible from public roads or trails; lighting does not cause reflected glare; and illumination of the project facilities, vicinity, and nighttime sky is minimized while still accomplishing the purpose for which the lighting is installed. The Applicant shall submit a Construction Lighting Mitigation Plan to the CPUC (all areas) and the USDA Forest Service (on NFS lands) for review and approval at least 60 days prior to the start of construction. The plan shall include, but is not necessarily limited to, the following: [1] Lighting shall be designed so exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. [2] The design of the lighting shall be such that the luminescence or light sources is shielded to prevent, to the extent reasonable, light trespass outside the project boundary; [3] All lighting shall be of minimum reasonable brightness consistent with worker safety. [4] Unless otherwise needed for security or other purposes, high illumination areas not occupied on a continuous basis shall have switches or motion detectors to light the area only when occupied. (VR–11b)

Impact VR-12: Short-term visibility of construction activities, equipment and night lighting associated with construction of the project.

Construction impacts related to the Powerhouse would result from the presence and visual intrusion of construction vehicles, equipment, materials, and work force at the powerhouse location and along the new transmission line routes. Construction activities around the Powerhouse site would involve the excavation of soil from the water conduits, penstock, powerhouse cavern and shaft, transformer gallery, surge shaft, draft tubes, tailrace tunnels, and intake/outlet structure. Construction activities would also affect the powerhouse site and its associated staging area. The landform in this area would be recontoured, excavated, and transformed from open space to a functioning underground powerhouse with aboveground substation and associated features. Effects during construction would include the presence of large excavation work, earthen debris, an open construction site. Adverse lighting impacts, attributable to night and security lighting, could occur if lighting at the powerhouse location is not appropriately controlled.

Construction impacts on visual resources would also result from the temporary alteration of landforms and vegetation along the right-of-way. Vehicles, heavy equipment, and workers would be visible during access and spur road clearing and grading, structure erection, conductor stringing, and site clearance and restoration. Depending on whether access roads to transmission towers are temporary or permanent, view durations would vary from moderate to extended.

Due to the relatively short construction duration in any one geographic area (approximately 24 months or less along the primary transmission line route where construction would be transient), viewers would be aware of the temporary nature of the impact. Extended viewing would reduce viewers' sensitivity to this short-term impact. Construction impacts would, therefore, generally constitute an adverse but less than significant visual impact.

Proposed PMEs to Address Impact VR-12

In order to mitigate any residual aesthetic resource impacts caused by the construction of the Proposed Project and to enhance aesthetic resources, the Applicant proposes the following PMEs:

- PME VR-11a and VR-11b, previously described.

Impact VR-13: Introduction of structure contrast and industrial character associated with the LEAPS Powerhouse, when viewed from Key Viewpoint L9 on Grand Avenue.

Land uses located along Grand Avenue include residential, commercial, and light-industrial uses and numerous vacant properties. Grand Avenue serves as an important arterial highway located along the south side of Lake Elsinore. Views along Grand Avenue are predominantly residential with the mountains rising in the background to the west and Lake Elsinore when visible through open spaces between houses and vegetation to the east.

As illustrated in Figure E.8-12, building associated with the proposed LEAPS Powerhouse would be visible from along Grand Avenue and from residents located in close proximity to the site. Limited views of the LEAPS Powerhouse site may also be available from Butterfield Elementary Visual and Performing Arts Magnet School, and the Ortega Trails Youth Center. The introduction of new low-rise structures possessing an industrial character would contrast with the primarily undeveloped and natural-appearing landscape that now exists at the proposed powerhouse site and may cause a moderate-to-high degree of overall visual change. Because the surface elevation of property adjacent to Grand Avenue would be raised to accommodate spoil material and reduce the need to export earthen material off the site and because the site would be terraced to accommodate the powerhouse and would be surrounded by a 8 to 10-foot-high concrete block wall, the proposed improvements would become a dominant focal point in the landscape and could block street-level views to the lower slopes of the mountains from Grand Avenue. There would be no skyline obstruction by these facilities.

Proposed PMEs to Address Impact VR-13

In order to mitigate any residual aesthetic resource impacts caused by the Powerhouse and substation and to enhance aesthetic resources, the Applicant proposes to prepare an Aesthetic Resources Plan to address this issue (and other related issues) in consultation with affected parties. Applicant could suggest the particular elements, such as landscape screening, as potential options under consideration.

Impact VR-14: Inconsistency with the USFS Scenic Integrity Objective due to long-term visibility of a non-natural landscape feature (upper reservoir facilities) from Key Viewpoints L3 and L10, on South Main Divide Road and from Key Viewpoint L5, Ortega Highway (Class I).

Project operations would require the long-term presence of a new non-naturally occurring, fenced reservoir (Decker Canyon Reservoir). The reservoir would undergo operational water-level fluctuations of up to 40 vertical feet on a daily basis and 75 vertical feet during the course of a full-week cycle, potentially resulting in an unnatural "bath tub ring" of exposed wet/drying earthen shoreline. The upper reservoir would be located within an area with a High SIO designation and would be prominently visible from and along segments of South Main Divide Road and Ortega Highway and from within portions of the San Mateo Canyon Wilderness.

Specifically, the development of the upper reservoir would eliminate a natural appearing canyon (Decker Canyon) and introduce new visual elements into the viewsheds of the National Forest and San Mateo Canyon Wilderness. Introduced features would include, but not necessarily be limited to, pooled water, dam face and spillway, chain link perimeter safety fences and reservoir maintenance road, and graded landscapes. As illustrated in Figure E.8-13 and Figure E.8-14, the high level of change resulting from the proposed reservoir could appear disharmonious.

Specifically, the proposed dam, reservoir, maintenance road, and fencing, would not repeat the form, line, color, texture, and pattern common to the existing landscape character so completely and at such scale that they are not evident, as required by the applicable “High” SIO. The proposed Decker Canyon Reservoir would become a prominent feature in the landscape. Although the resulting visual impacts may be significant, the introduction of a water feature into the National Forest would add visual diversity and could be deemed by the Forest Service to be harmonious with the natural landscape.

Proposed PMEs to Address Impact VR-14

In order to mitigate any residual aesthetic resource impacts caused by the presence of the proposed upper reservoir and to enhance aesthetic resources, the Applicant proposes the following PME:

- Upper Reservoir Revegetation - Newly planted vegetation shall be fertilized, irrigated, and maintained by the Applicant in accordance with USDS Forest Service requirements and specifications. (VR-14).

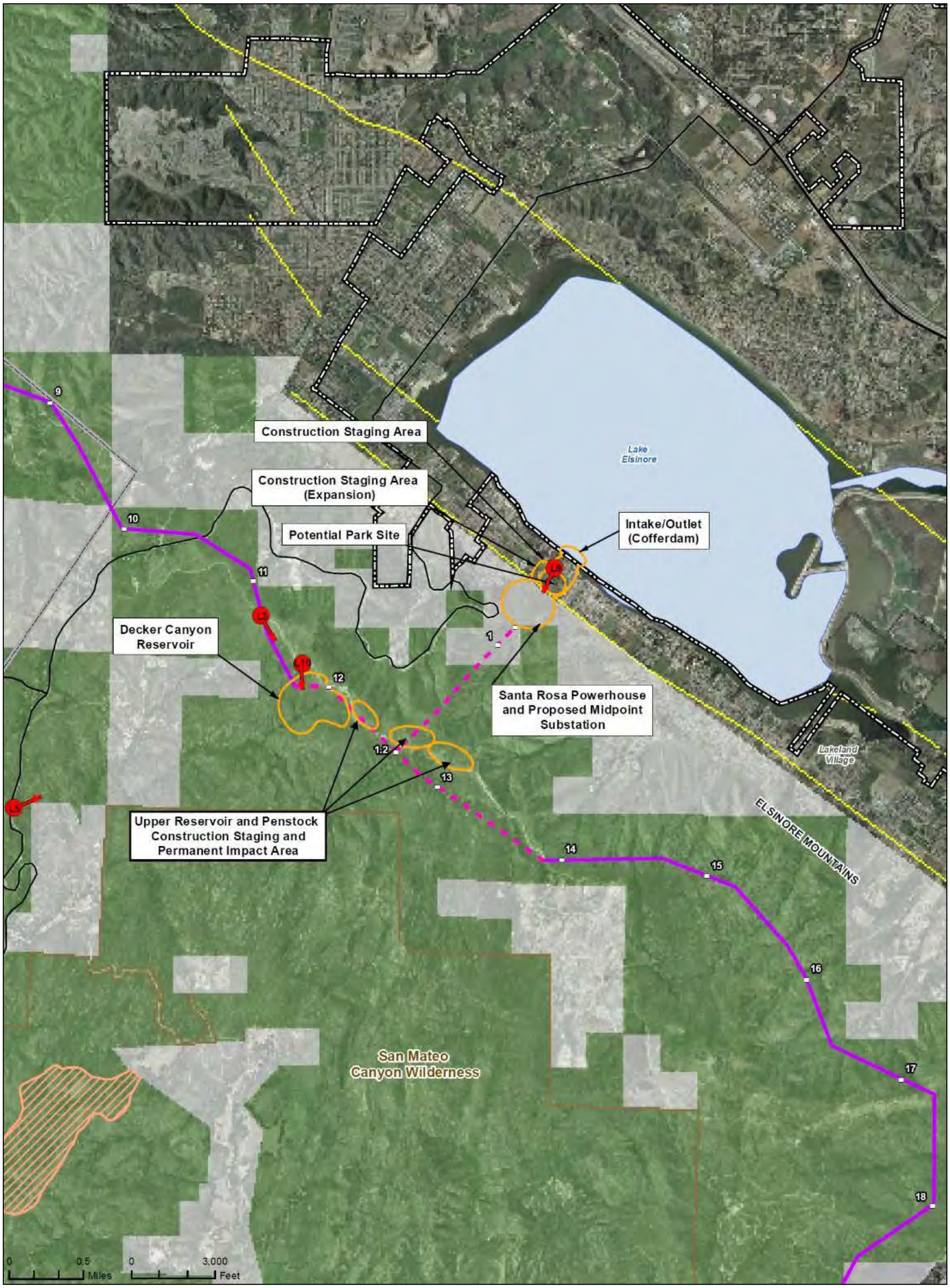

Figure E.8-7: Key Project Viewpoints
Source: California Public Utilities Commission

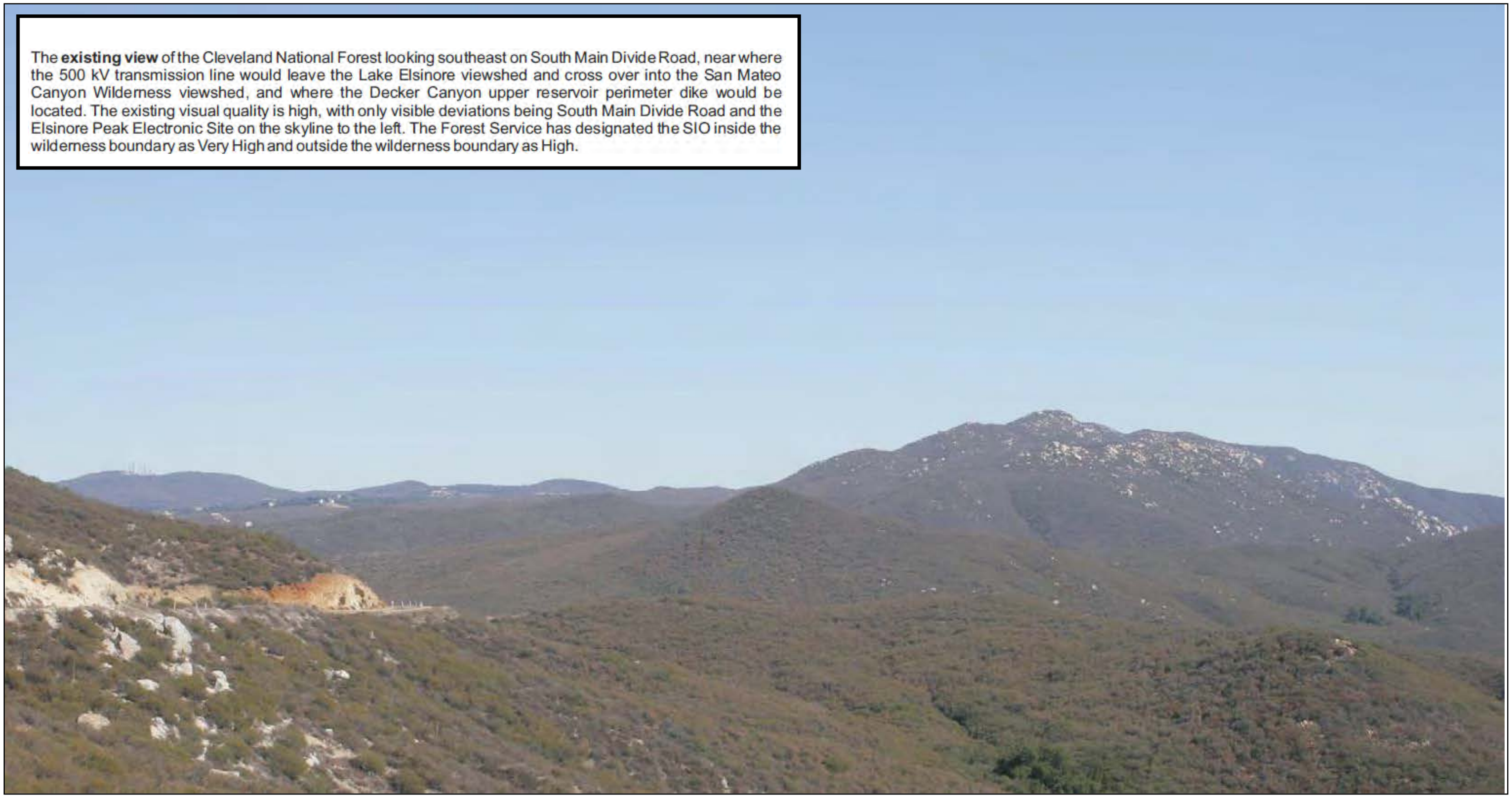

Figure E.8-8: KVP L3 – Existing View – South Main Divide Road near North Transition Station
Source: California Public Utilities Commission

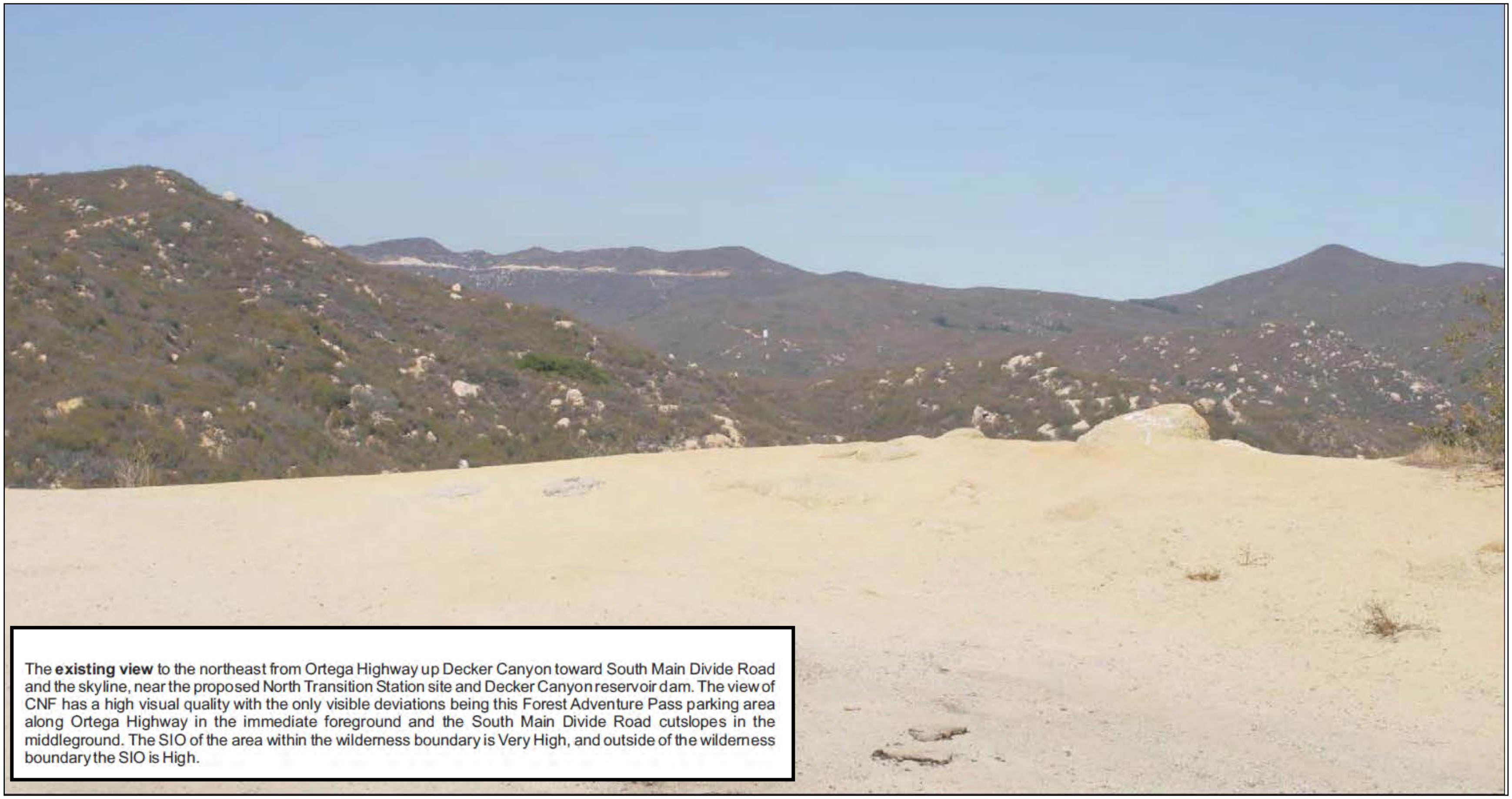

Figure E.8-9: KVP L5 – Existing View – Ortega Highway
Source: California Public Utilities Commission

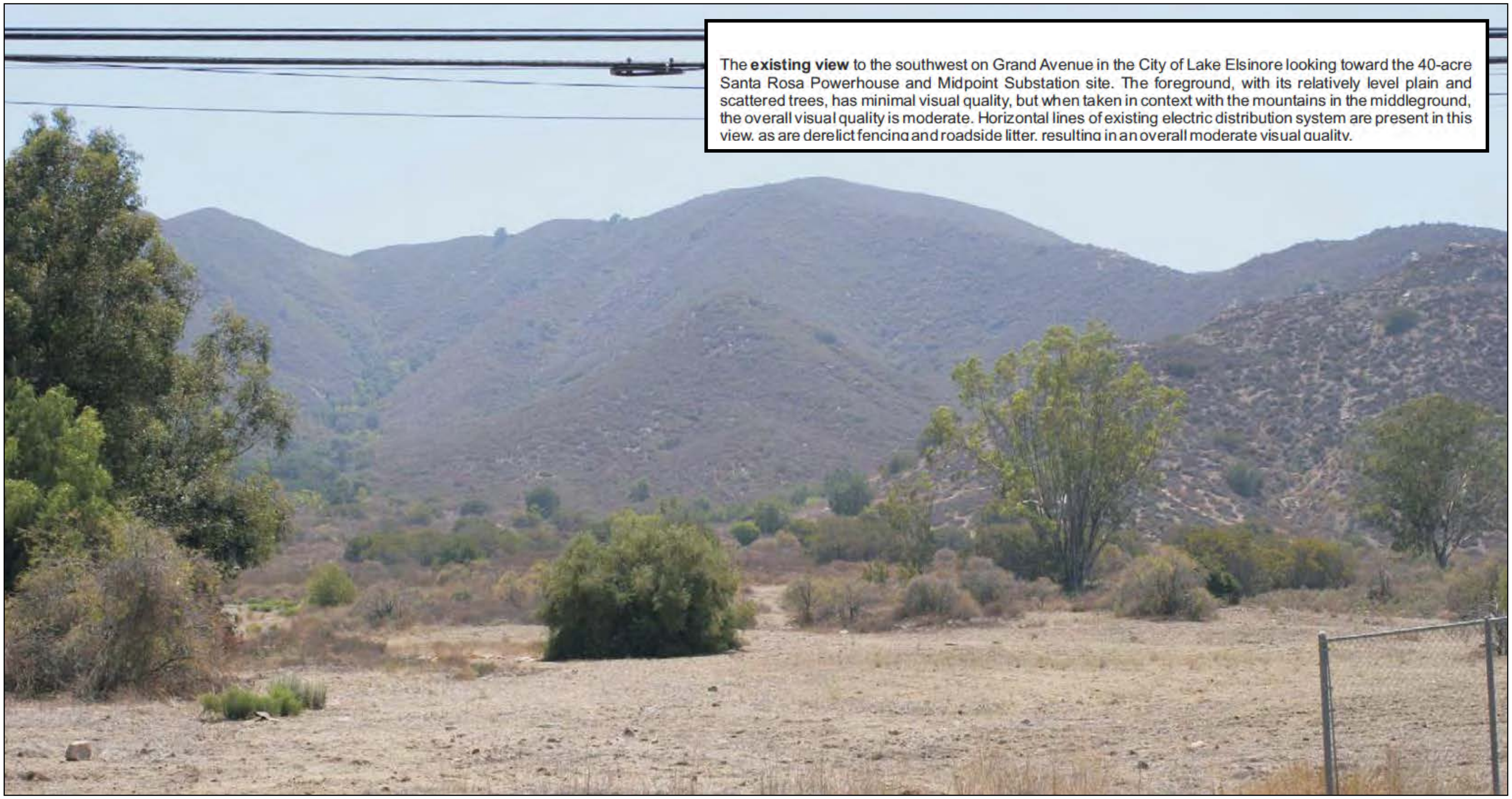

Figure E.8-10:KVP L9 – Existing View – Grand Avenue
Source: California Public Utilities Commission

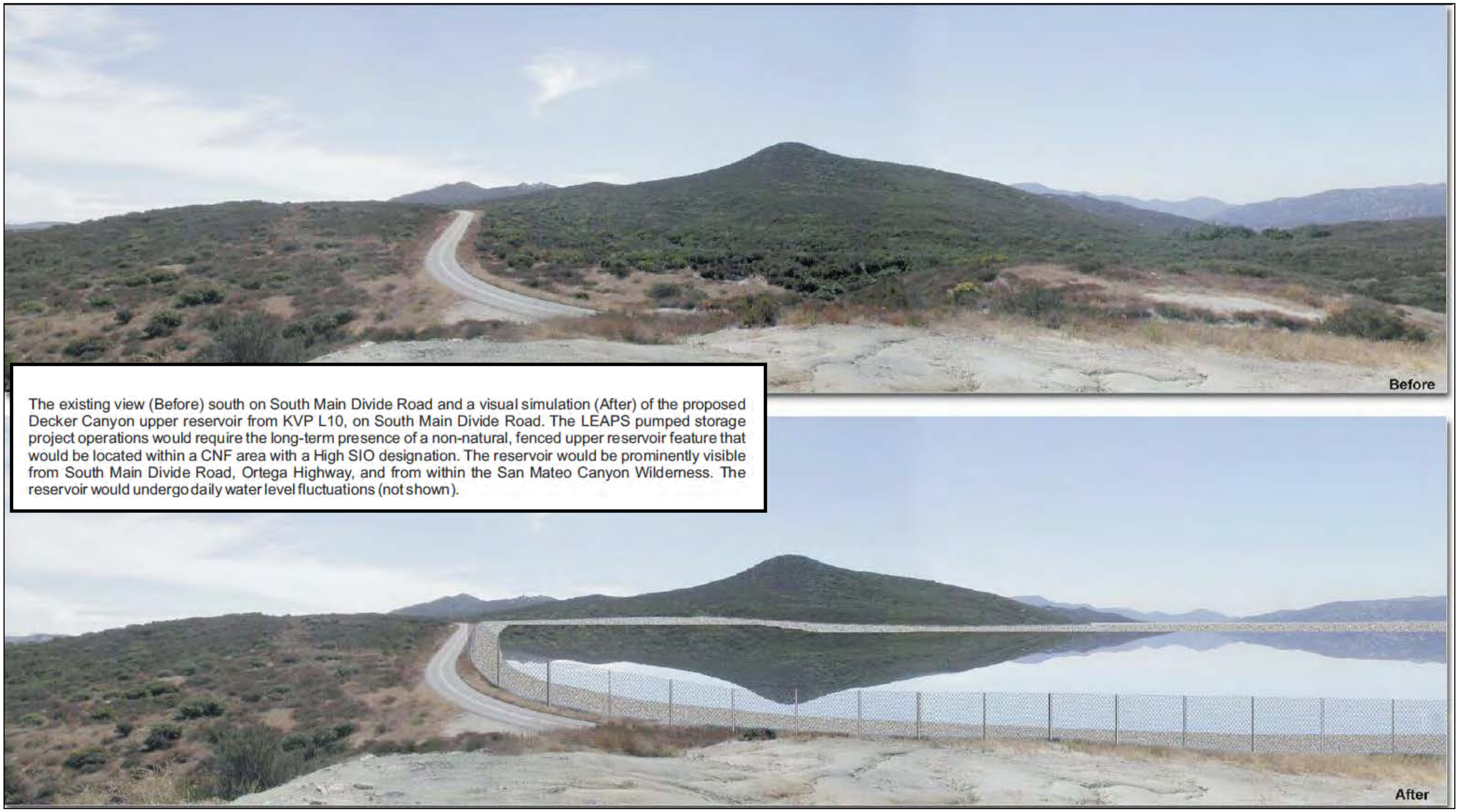

Figure E.8-11:KVP L10 Existing View and Simulation - South Main Divide Road near Decker Canyon Reservoir Site

Source: California Public Utilities Commission

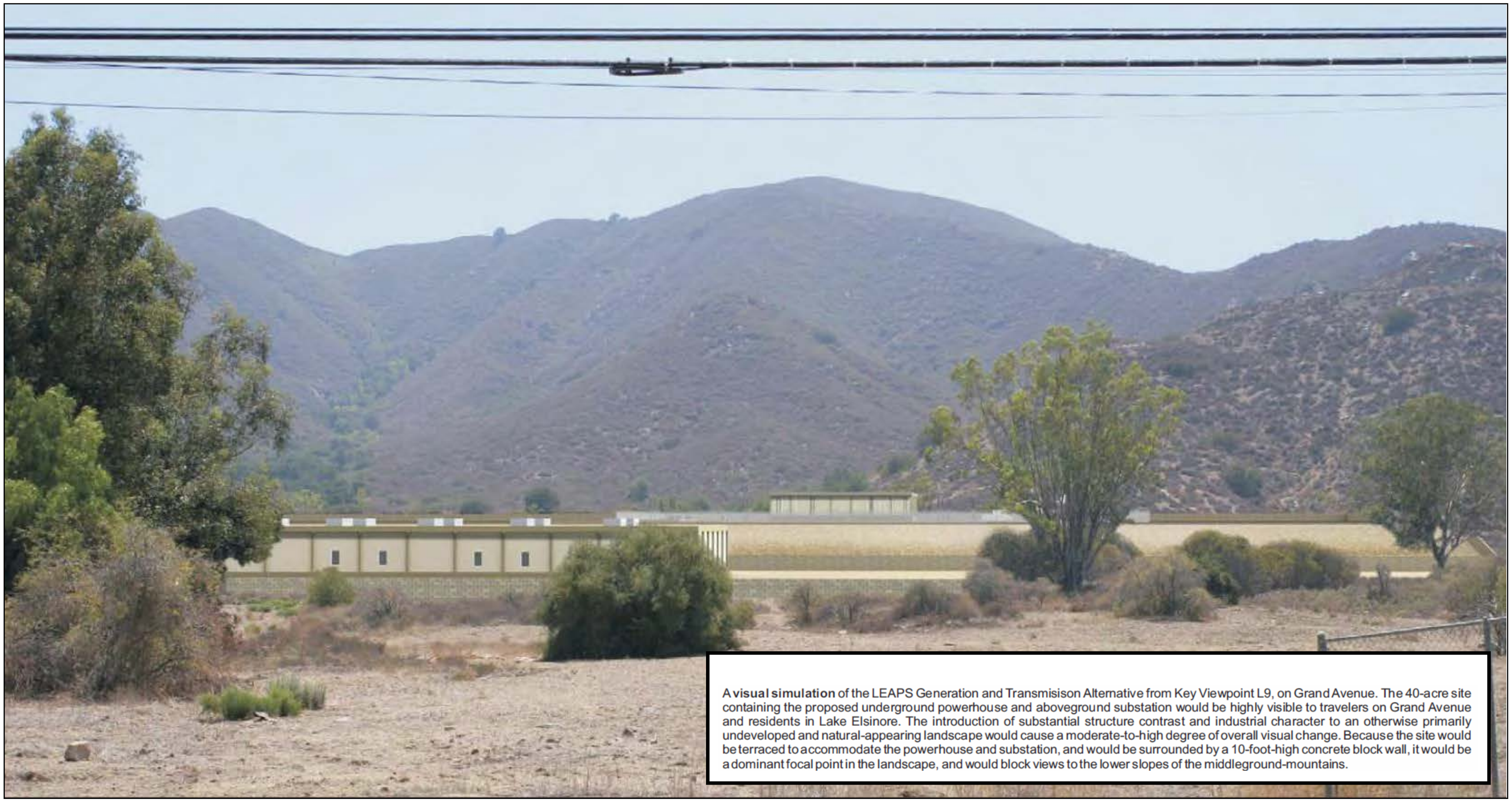

Figure E.8-12: KVP L9 Simulation – Grand Avenue
Source: California Public Utilities Commission

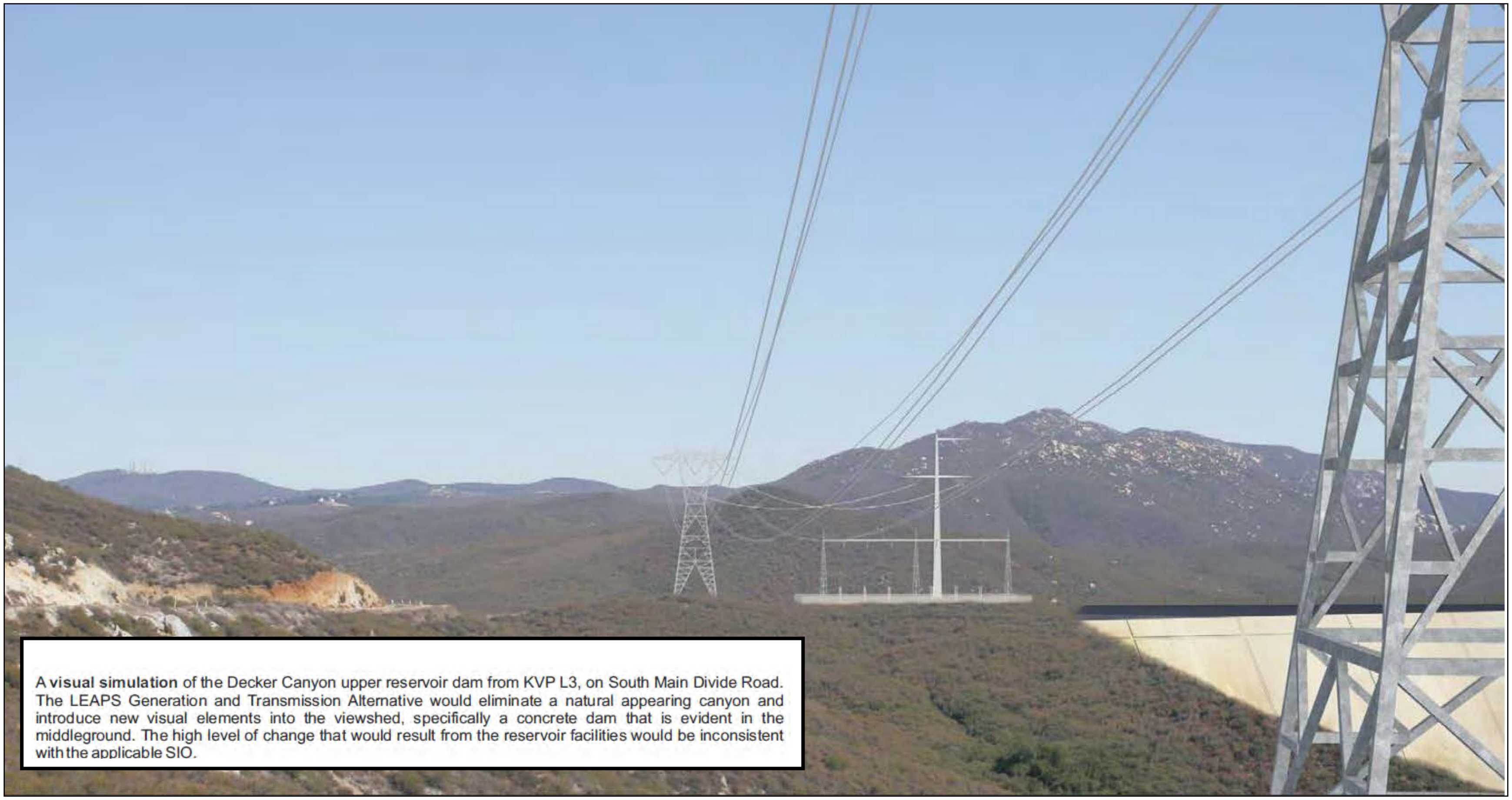

Figure E.8-13:KVP L3 Simulation – South Main Divide Road near North Transition Station
Source: California Public Utilities Commission

Figure E.8-14:KVP L5 Simulation – Ortega Highway
Source: California Public Utilities Commission

8.5.2 Potential Impacts of Primary Transmission Line

The Proposed Project's primary transmission line being proposed will be installed underground along existing roads and other existing linear infrastructure.

One or more KVPs have been established from which detailed setting characterizations have been developed to represent visual resources along each of the northern and southern primary transmission lines.

KVP L9: Grand Avenue. As illustrated in Figure E.8-10, KVP L9 was established on Grand Avenue in the City of Lake Elsinore. Views perpendicular to the road, looking southwest, reveal a relatively flat, open space leading to the foot of the Elsinore Mountains in the CNF. Just northwest of this site, along Grand Avenue, are two multi-family residential complexes, Butterfield Elementary Visual and Performing Arts Magnet School, and the Ortega Trails Youth Center, all on the same side of the street. Continuing south on Grand Avenue, there are scattered single-family residences.

Visual Quality (Moderate). The foreground, with its relatively level plain and scattered trees, has minimal visual quality, but, when taken in context with the mountains in the middle ground, the overall visual quality is moderate. Predominant colors are brown and tan soils and gray-green to dark-green vegetation. Rockforms are non-distinctive and water is lacking. Horizontal lines of the existing electric subtransmission system are present in this view, as are derelict fencing and roadside litter, resulting in an overall moderate visual quality.

Viewer Concern (Moderate). Travelers on Grand Avenue, and also viewers at the apartment complex (Santa Rosa Mountain Villa Apartments) and elementary school, are provided with distinct mountain views as they pass this property. Although there are some commercial land uses along Grand Avenue, the neighborhood is primarily residential in nature and any addition of industrial character to the predominantly natural appearing landscape or blockage of views to more valued landscape features (open space and mountain slopes) would be seen as an adverse visual change.

Viewer Exposure (High). There is no vegetative or topographic screening for the proposed Santa Rosa Substation, and viewing distances allow details to be seen in the foreground and context to be evaluated against the middle ground mountainside, resulting in high visibility. Viewing times are brief for travelers on Grand Avenue but are extended for residents located along Grand Avenue and at the elementary school, and for pedestrians walking along Grand Avenue. The number of viewers would be moderate and the duration of view would be brief for travelers on Grand Avenue and extended for residents and school children. Consequently, viewer exposure is high.

Overall Visual Sensitivity (Moderate-to-High). For travelers on Grand Avenue and residents/school children in the neighborhood in the vicinity of the Santa Rosa Substation, combining the moderate visual quality, low-to-moderate viewer concern, and high viewer exposure leads to a moderate-to-high overall visual sensitivity of the visual setting and viewing characteristics.

KVP L2: Lake Elsinore. As illustrated in **Error! Reference source not found.** and in **Error! Reference source not found.**, KVP L2 was established on the lake surface of Lake Elsinore near the boat ramp at the east shore. Views to the northern [and southern] primary transmission line as it would cross the face of the mountains west of Lake Elsinore are similar from many vantage points in the City of Lake Elsinore, on the lake surface, on city streets, and along the I-15 Freeway. Two specific vantage points (I-15 Freeway and Lake Elsinore) would view the same target landscape (the front zone of Lake Elsinore and the National Forest) and visual effects would be similar.

The I-15 Freeway is a federal interstate highway located less than one mile at its closest point to the east shore of Lake Elsinore and receives heavy commercial as well as non-commercial travel use. The towers, conductors, and resulting footprint of the primary connection would be visible from the I-15 Freeway and the City of Lake Elsinore. This would introduce additional structure contrast and industrial character to an otherwise primarily natural appearing landscape (though existing utility transmission and subtransmission lines are visible in portions of the suburban interface zone).

Boaters on Lake Elsinore are afforded 360-degree views of the lake in the foreground and the mountains in almost all directions in the distance. Due to the hazy conditions that often predominate at Lake Elsinore, the northern primary transmission line would be somewhat obscured, depending on weather conditions. The presence of water in this landscape increases visual quality, and with the contrasting vertical landforms southwest of the lake, visual variety is considered Class A. Visual sensitivity is high, based on a high number of viewers who value and appreciate scenic quality of the surrounding landscape from their homes, streets, highways, and businesses.

Potential visual resource impacts associated with the primary transmission lines and the Case Springs and Lake Substations are summarized in Table E.8-1.

Table E. 8-1. Primary Transmission Line– Visual Resource Impacts

Impact	Description
VR-12	Short-term visibility of construction activities, equipment and night lighting associated with construction of the project.

Source: The Nevada Hydro Company, Inc.

Impact VR-12: Short-term visibility of construction activities, equipment and night lighting associated with construction of the project.

Construction impacts related to the transmission line would result from the presence and visual intrusion of construction vehicles, equipment, materials, and work force along the new transmission line route. Construction activities would involve the excavation of a trench, installation of vaults, stringing of cable, concrete pouring and resurfacing.

Effects during construction would include the presence of excavation work, earthen debris, an open trench and manual labour. Adverse lighting impacts, attributable to morning and evening lighting, could occur but would be limited in scope and duration.

Due to the relatively short construction duration in any one geographic area along the primary transmission line route where construction would be transient, viewers would be aware of the temporary nature of the impact. Extended viewing would reduce viewers' sensitivity to this short-term impact. Construction impacts would, therefore, generally constitute an adverse but less than significant visual impact.

Proposed PMEs to Address Impact VR-12

In order to mitigate any residual aesthetic resource impacts caused by the construction of the Proposed Project and to enhance aesthetic resources, the Applicant proposes the following PMEs:

- PME VR-11a and VR-11b, previously described.

8.5.3 Cumulative Impacts – Aesthetics (Visual Resources)

The cumulative aesthetic impacts resulting from the implementation of the Project (inclusive of both the primary transmission lines and generation) would be similar to the combined effects presented in those two preceding sections.

AMENDED APPLICATION FOR LICENSE
OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E
ENVIRONMENTAL REPORT
SECTION 9 – REPORT ON LAND USE

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

The Nevada Hydro Company, Inc.

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Federal Energy Regulatory Commission
Project Number: P-14227
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Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
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EXHIBIT E – SECTION 9 REPORT ON LAND USE

As required under 18 CFR 4.41(f)(9), the applicant must provide a report that describes the existing uses of the proposed project lands and adjacent property, and those land uses which would occur if the project is constructed. The report may reference the discussions of land uses in other sections of this exhibit. The report must be prepared following consultation with local and state zoning or land management authorities, and any Federal or state agency with managerial responsibility for the proposed project or abutting lands. The report must include:

1. A description of existing land use in the proposed project area, including identification of wetlands, floodlands, prime or unique farmland as designated by the Natural Resources Conservation Service of the U.S. Department of Agriculture, the Special Area Management Plan of the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration, and lands owned or subject to control by government agencies;
2. A description of the proposed land uses within and abutting the project boundary that would occur as a result of development and operation of the project; and
3. Aerial photographs, maps, drawings or other graphics sufficient to show the location, extent and nature of the land uses referred to in this section.

9.0 LAND USE

9.1 Land Use Setting

9.1.1 Local Municipalities

` As illustrated in Figure E.9-4,[1] the City of Lake Elsinore is located approximately 22 miles southeast of the City of Corona, 73 miles southeast of the City of Los Angeles, and 74 miles north of the City of San Diego. It is bounded by the Cleveland National Forest (CNF) on the south, the Gavilan Hills on the north, the Temescal Valley on the west, and the Sedco Hills on the east. The City encompasses a land area of approximately 24,823 acres and contains a Sphere Of Influence (SOI) covering 25,063 acres.[2,3]

The SOI, as adopted by the Riverside County Local Agency Formation Commission (LAFCO), represents the probable future boundaries and service area of the City, Lakeland Village (Cleveland Ridge), Horsethief Canyon, Alberhill, Sedco Hills, The Farm, and the areas south and west of Lee (Corona) Lake are located within the City's SOI. With the exception of Horsethief Canyon, Lakeland Village, and The Farm, development within the SOI is characterized by rural, large-lot residential uses, mobilehome parks, mining lands, scattered agricultural uses, and commercial uses.

As illustrated in Figure E.9-1,[4] for planning purposes and based on an area of 23,036 acres, the "City of Lake Elsinore General Plan" divides the City into 19 land use designations. The most predominant land-use designations within the City include "Specific Plan" (15,295 acres [66.4%]), "Lake Elsinore" (2,791 acres [12.12%]), "Low-Medium Density Residential" (1,442 acres [6.27%]), and "Low-Density Residential" (487 acres [2.11%]).[5] Existing land uses within the City are shown in Figure E.9-3

- **County of Riverside.** On October 7, 2003, the County of Riverside adopted a comprehensive update of the Riverside County General Plan. In addition to Countywide policies, the Riverside County General Plan identifies individual "area plans" for many unincorporated areas, providing detailed land use and policy direction regarding local issues. A portion of the "Elsinore Area Plan" is illustrated in Figure E.9-2. According to the Elsinore Area Plan, lands located within the general Project vicinity primarily includes areas designated "Open Space Conservation - Habitat (CH)," "Rural Mountainous (RM)," and "Medium-Density Residential (MDR)."

  As indicated by the County: "The Elsinore Area Plan reflects the proposed General Plan objectives for Riverside County in several ways. It does so by intensifying and mixing uses at nodes adjacent to transportation corridors, by more accurately reflecting topography and natural resources in land use designations, by avoiding high intensity development in natural hazard areas, and by considering compatibility with adjacent communities' land use plans as well as the desires of residents in the plan area. It provides for up to two Community Centers. The land use designations maintain the rural community character of Meadowbrook and Warm Springs, the natural and recreational

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[1]/ Riverside County Local Agency Formation Commission (LSA), Final Draft Municipal Service Review for the Western Riverside County Area, May 2005.

[2]/ *Id*., p. 4-1.

[3]/ In contrast, the City of Lake Elsinore indicates that the "City of Lake Elsinore is approximately 38 square miles with a sphere of influence covering over 78 square miles" (Source: City of Lake Elsinore, Lake Elsinore General Plan, Land Use and Recreation Background Report, January 2006, p. 1-3).

[4]/ *Id.*, Lake Elsinore General Plan, Land Use and Recreation Background Report, Figure 1-1, p. 13.

[5]/ *Id*., p. 1-4.

characteristics of the CNF, and Community Development uses in Wildomar and Cleveland Ridge. In addition to providing habitat and recreational value, the conservation linkages within the Area Plan help provide a separation between communities and provide additional definition for existing communities."[6]

According to the Riverside County General Plan, the population of Riverside County is expected to grow to a total of about 1.4 million people by 2020. Based on that projected growth, the Riverside County General Plan focuses primarily on growth-related issues such as community design, design, and ways to achieve an integrated and coordinated land use, open space, and transportation system. As indicated in the Riverside County General Plan, the preferred pattern is to focus growth into strategically located centers or into existing developed areas in order to minimize development pressures on rural, agricultural, and open space areas. The Land Use Element acknowledges the importance of infrastructure and public facilities in supporting an increase in population but does not directly address regional infrastructure facilities.[7]

Within Riverside County, many of the proposed facilities would be located within the area of the "Elsinore Area Plan" (EAP). The EAP encompasses unincorporated County areas surrounding the City of Lake Elsinore and focuses on preserving the numerous unique features in the Lake Elsinore area while, at the same time, accommodating future growth. To accomplish this, more detailed land-use designations are applied than for the Riverside County General Plan. The EAP describes the area setting, various communities, policy and hazard areas, and other attributes. Those EAP provisions that appear most relevant to the Project include the following:

– Unique features. Unique features include the CNF and the Temescal Wash.

– Unique communities. The EAP lists five unique communities, a designation that includes unincorporated areas that may be annexed, incorporated as a new city, or designated as an unincorporated community. The proposed Santa Rosa Substation and LEAPS Powerhouse sites are located in the Lakeland Village (Cleveland Ridge) community, while the proposed northern primary transmission line alignment terminates near Warm Springs.

– Policy areas. The EAP lists eight special policy areas designed to address important locales that have special significance to the residents. Three of these are relevant to the proposed Project's sites. As noted, the northernmost end of the proposed northern primary transmission line terminates near the Warm Springs area, which has policies to "protect the life and property of residents and maintain the character of the Gavilan Hills" through adherence to various elements of the Riverside County General Plan. The area of Temescal Wash that is within the 100-year flood plain is a designated policy area, with policies to encourage the maintenance of the wash in its natural state. The third policy area relevant to the Project is the "Lake Elsinore Environs Policy

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[6]/ *Id.*, CEQA Findings of Fact and Statement of Overriding Considerations of the Board of Supervisors of Riverside County for the 2003 Riverside County General Plan, Area Plans.

[7]/ The Riverside County General Plan accommodates support services such as governmental facilities, utility facilities (including public and private electric generating stations and corridors), landfills, airports, educational facilities, and maintenance yards with the "Public Facility Area Plan Land Use Designation" (designed to provide for adequate public facilities within the County while ensuring compatibility with surrounding land uses). The policies for public facilities state, in part, that the "Public Facilities Land Use Designation" is to: (1) Accommodate the development of public facilities in areas appropriately designated by the General Plan and area plan land use maps; (2) Require new public facilities to protect sensitive uses such as schools and residences from the effects of noise, light, fumes, odors, vehicular traffic, parking, and operational hazards; (3) Require that public facilities be designed to consider their surroundings and visually enhance, not degrade, the character of the surrounding areas; and (4) Require that development and conservation land uses do not infringe upon existing public utility corridors, corridors, fee owned rights-of-way, or permanent easements whose true land use is that of public facilities.

Area," which is along the west shoreline of the lake, encompassing the 100-year floodplain and containing policies prohibiting the development of structures.

- Multi-purpose open space. The EAP area contains significant oak woodlands that should be protected to preserve habitat and the character of the area.
- Hazards. The plan sets forth local hazard policies with respect to flooding, wildland fire hazard, seismic faults, and slope instability, indicating which hazards should be avoided entirely and which can be mitigated by special building techniques.

The EAP specifically identifies the "Glen Eden Policy Area."[8] In addition, the Lakeland Village area is located in the "Lakeland Village/Wildomar Sub-Area of Redevelopment Project Area 1-1986," as approved by the County of Riverside on December 23, 1986.

The Western Riverside County Multi species Habitat Conservation Plan (MSHCP) was adopted by the Riverside County Board of Supervisors on June 17, 2003 and includes 16 area plans, including the "Lake Elsinore Area Plan" (which includes the City of Lake Elsinore and the City of Canyon Lake). The MSHCP is intended to promote the conservation of natural habitat areas and preserve biological and ecological diversity in western Riverside County. The MSHCP has the potential to constrain new development due to the requirement of land to be set-aside as permanent open space.

The Western Riverside County MSHCP's "Lake Elsinore Area Plan" designates general areas within the City as areas in need of conservation. Examples include wetlands around Lake Elsinore and the floodplain (Back Basin) to the east of the lake. The plan also identifies the need to provide connectivity between the Santa Ana Mountains, Temescal Wash, and the foothills north of Lake Elsinore that may require that some of these areas remain, at least partially, undeveloped. The Western Riverside County MSHCP has identified particular areas within Lake Elsinore where land should be preserved to maintain core and linkage habitat for existing endangered and threatened species.

The Riverside County Planning Department is developing community specific visions and design guidelines for several unique Riverside County communities, including for the area of Temescal Valley.9 The proposed Lake Switchyard and a portion of the proposed northern primary transmission line is located within the Temescal Valley area.

The community of Lakeland Village (Cleveland Ridge) is located immediately west of Lake Elsinore and includes a major ridge along the eastern face of the Santa Ana and Elsinore Mountains. This community incorporates the Lakeland Village Redevelopment Project Area south of Lake Elsinore, which comprises a mix of urban residential and commercial uses along Grand Avenue on the low-lying areas adjacent to the lake. Natural open space areas, with pockets of rural residential uses, are located adjacent to Ortega Highway along the steep easterly face of the Santa Ana Mountains. An area known as the "Lake View Sphere" includes the community of El Cariso and is located on the eastern facing slope in the general Project area, within the boundaries of the CNF, further west of Lake Elsinore and north of Ortega Highway. On the western face of the Santa Ana and Elsinore Mountains, small rural residential communities include Rancho Capistrano, which is located within a privately owned in-holding within the CNF.

[8]/ The "Glen Eden Policy Area" consists of portions of Sections 17, 18, and 19 located southwesterly of Temescal Canyon Road and northerly, northeasterly, and westerly of the Horsethief Canyon community.

[9]/ Riverside County Planning Department (PDS West), Draft Temescal Valley Design Guidelines, February 27, 2007.

The area around the proposed Decker Canyon Reservoir is presently used primarily for water conservation and recreational purposes. An established trail system (Morgan Trail) descends from South Main Divide Truck Trail into Morrell Canyon and the San Mateo Canyon Wilderness. This area is located near a number of established hang glider launches. South Main Divide Truck Trail serves as the sole access road to the residential uses located in and around Rancho Capistrano (approximately four miles southeast of Ortega Highway) and to the Wildomar OHV area (approximately nine miles southeast of Ortega Highway). To the east of the proposed upper reservoir sites is Elsinore Peak, where the USDA Forest Service has issued a number of special use permits for operation of telecommunications facilities (currently comprising of six towers and five buildings). Northwest of the proposed upper reservoir sites, nearby land uses include the USDA Forest Service's El Cariso Fire Station (32353 Ortega Highway, Lake Elsinore), an adjacent visitor information facility, and El Cariso Campground.

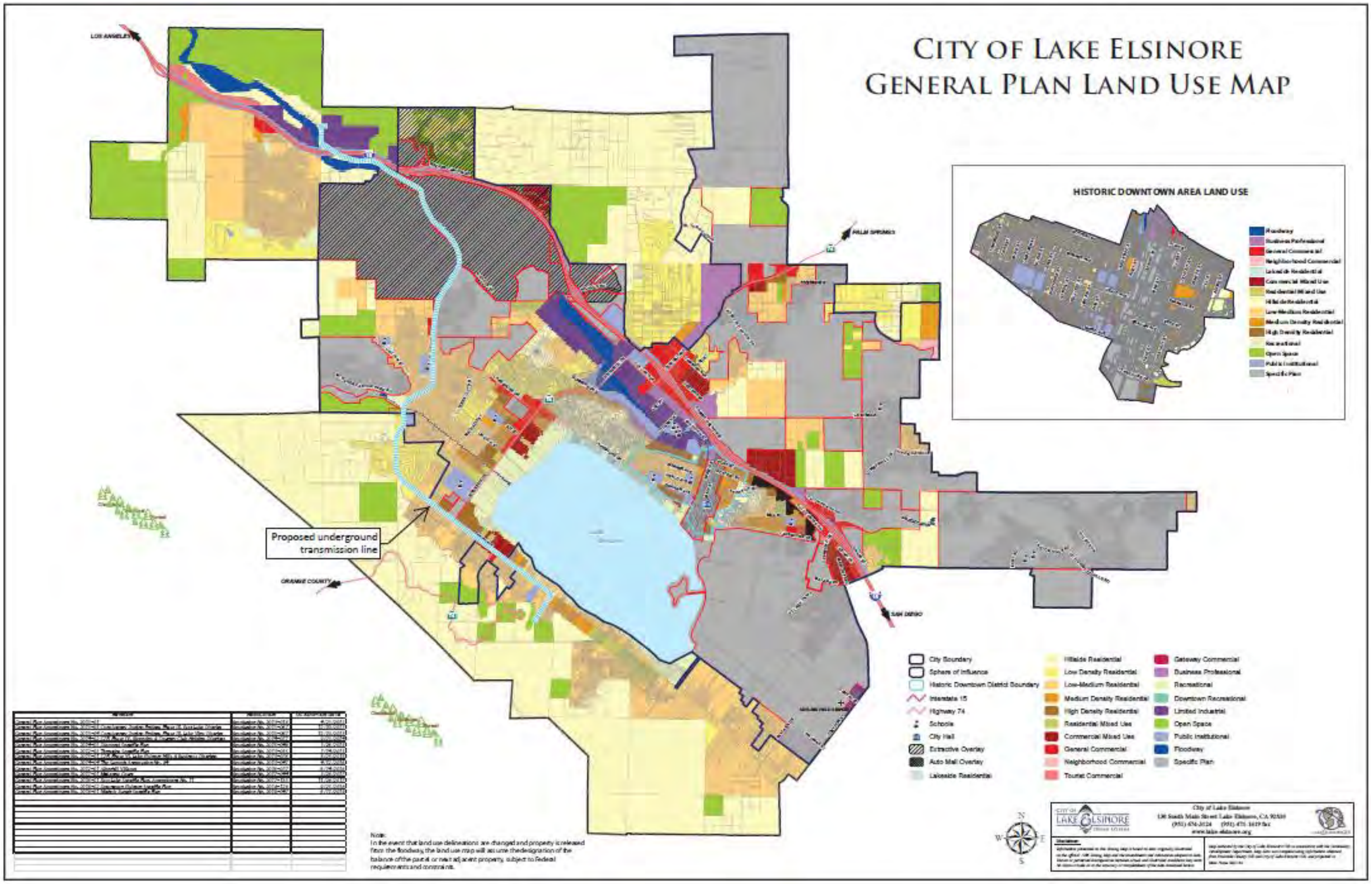

Figure E.9-1: City of Lake Elsinore Existing General Plan
Source: City of Lake Elsinore

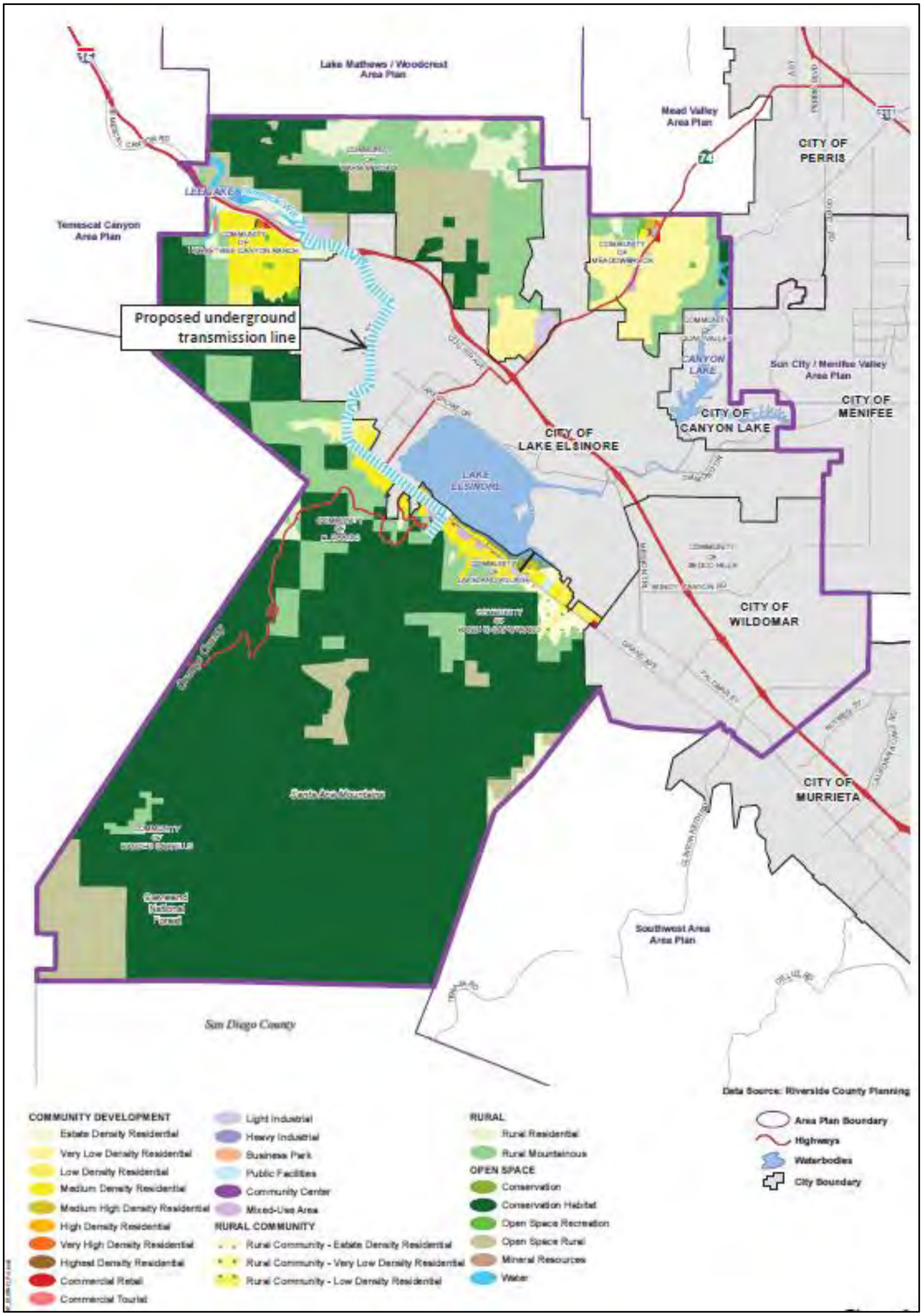

Figure E.9-2: County of Riverside - Elsinore Area Plan
Source: County of Riverside

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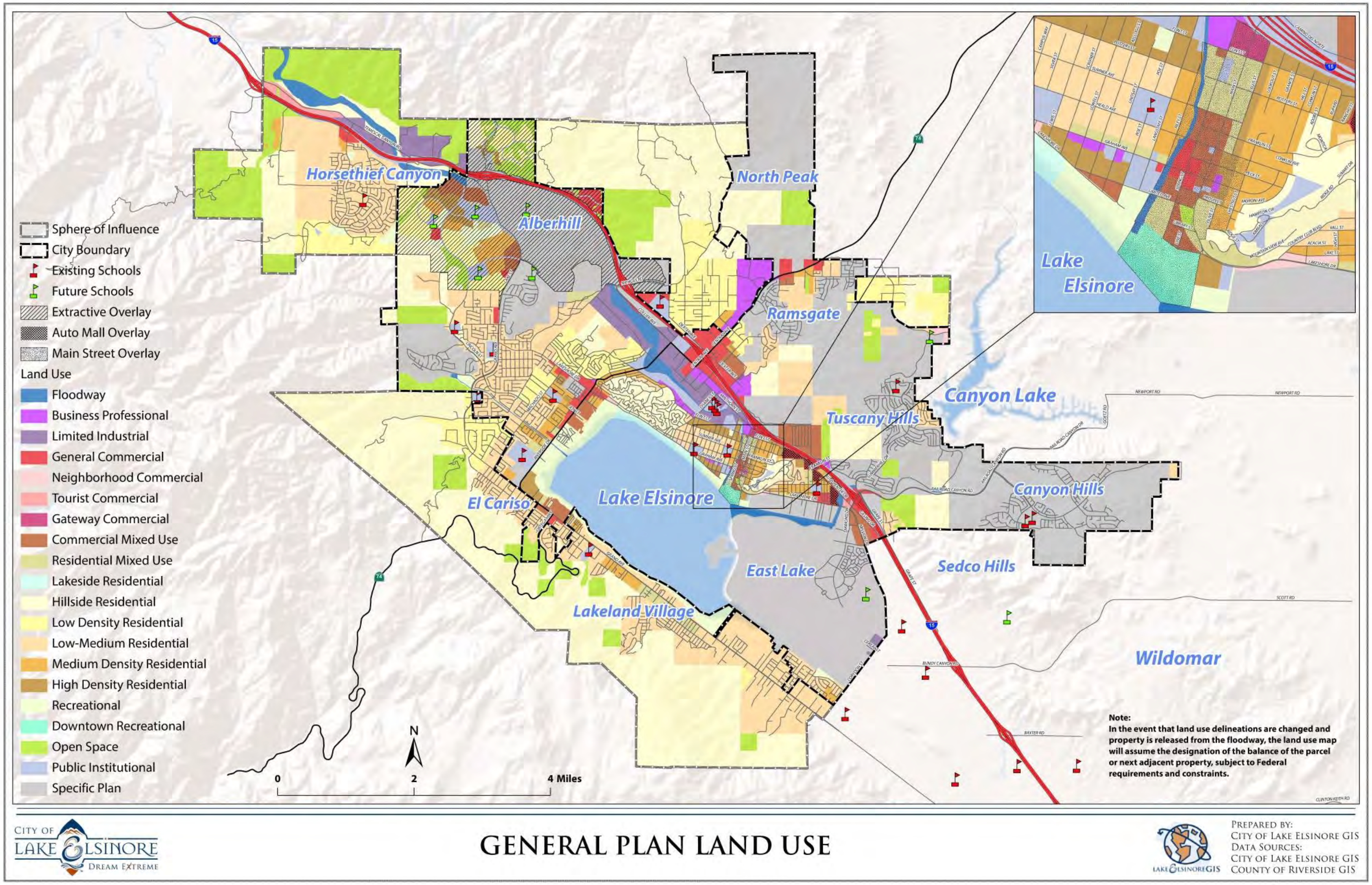

Figure E.9-3: City of Lake Elsinore Existing Land Uses
Source: City of Lake Elsinore

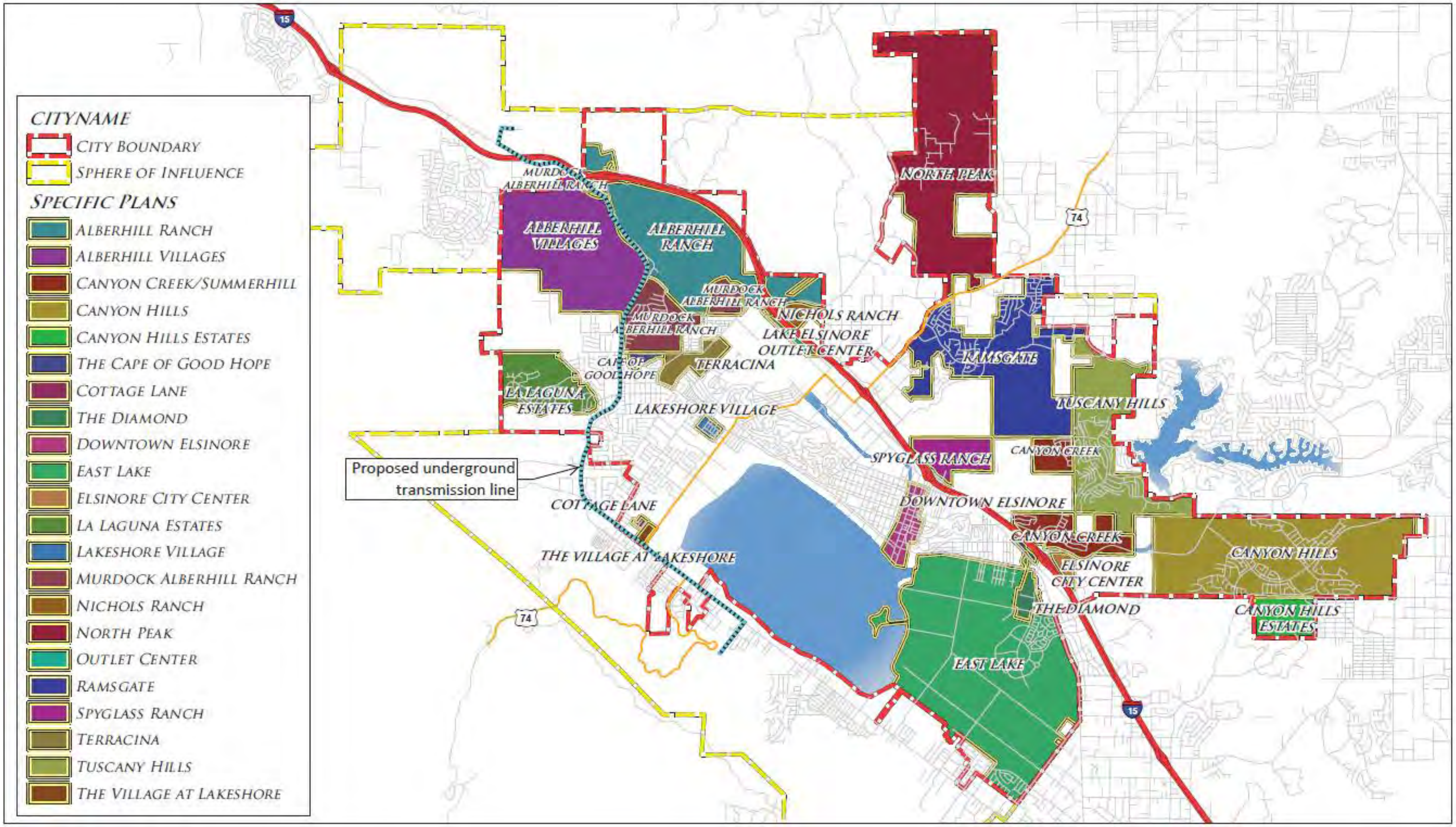

Figure E.9-4: City of Lake Elsinore Sphere of Influence
Source: Riverside Local Agency Formation Commission

9.2 Land Use Regulatory Setting

The following general discussion is presented of certain Federal, State, and local statutes and regulations that may be most applicable to an understanding of the Project's regulatory setting.

- Federal Power Act. The FPA requires that all non-Federal hydropower projects on navigable waters to be licensed. FERC is the independent regulatory agency that has exclusive authority under the FPA to license such projects. Section 4(e) of the FPA (16 U.S.C. 797[e]) applies to hydropower facilities located on federally-reserved lands (e.g., Indian reservations, national forests) and stipulates that FERC is obligated under the FPA to ensure that its permits do not "interfere with. . .the purpose for which any reservation affected thereby was created or acquired." Under Section 4(e), the Secretary of the department with jurisdiction over the reserved land has the authority to issue any license conditions necessary to maintain the reservation. Depending on the purpose of the reservation, the agency's conditions may address a range of goals, including the preservation or enhancement of recreation, Federal lands, and aquatic habitats.[10]
- Federal Aviation Regulations. Federal regulations (14 CFR Part 77) establish standards and notification requirements for objects affecting navigable airspace. Federal Aviation Administration (FAA) Regulations (FAR Part 77) allows the FAA to identify potential aeronautical hazards in advance, thus preventing or minimizing adverse impacts to the safe and efficient use of navigable airspace. In order to protect the critical airspace around airports and allow safe aircraft operation, Part 77 defines a system of imaginary (three-dimensional) spaces around airports through which no fixed object or structure should penetrate. Public agencies or private developers proposing to construct structures or locate objects that would penetrate the Part 77 imaginary surfaces must notify the FAA. FAA review will then determine whether the object should be allowed and, if so, how it should be marked and/or lighted. An object constitutes an obstruction to navigation if the proposed construction or alteration falls within any of the following categories: (1) greater than 200 feet above ground level (AGL) at its location; (2) near a public-use or military airport, heliport, or seaplane base; (3) highways and railroads; (4) objects on a public-use or military airport or heliport; or (5) when requested by the FAA. Structures requiring FAA notification include antenna towers, overhead communication and transmission lines, water towers, and stockpiles of equipment.[11] The FAA has established standards for marking and lighting structures, such as buildings, towers, and overhead wires.[12]

  General Operating and Flight Rules specifically prohibit low-flying aircraft, except when necessary for takeoff or landing.[13] The FAA indicates that obstructions can be marked or lighted to warn airmen of

[10]/ Congressional Research Service (Kyna Powers), Hydropower License Conditions and the Relicensing Process, CRS Issue Brief for Congress, Order Code IB10122, updated June 9, 2003, p. CRS-2.

[11]/ Federal Aviation Administration, Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace, Advisory Circular AC 70/7460-2K, March 1, 2000.

[12]/ Federal Aviation Administration, Obstruction Marking and Lighting, Advisory Circular AC 70/7460-1K, February 1, 2007.

[13]/ As specified, no person may operate an aircraft below the following altitudes: "(a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface. (b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. (c) Over other than congested areas. An altitude of 500 feet above the surface except over open water or sparsely populated areas. In that case, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure. (d) Helicopters. Helicopters may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section if the operation is conducted without hazard to persons or property on the surface. In addition, each person operating a helicopter shall comply with routes or altitudes specifically prescribed for helicopters by the Administrator" (14 CFR 91.119).

their presence. Lighted markers are available for increased night conspicuity of high-voltage (69 kV or higher) transmission line catenary wires.[14]

- Standard Enabling Acts. The United States Department of Commerce institutionalized comprehensive planning in the Standard Zoning Enabling Act of 1926 (SZEA) and the Standard City Planning Enabling Act of 1928 (SCPEA). The SZEA allowed municipalities to adopt zoning regulations and specified that zoning must be in accordance with the comprehensive plan. The SZEA included a grant of power, a provision that the legislative body could divide the local government's territory into districts, a statement of purpose for the zoning regulations, and procedures for establishing and amending the zoning regulations. A legislative body was required to establish a zoning commission to advise it on the initial development of zoning regulations. In 1926, the United States Supreme Court (Euclid vs. Ambler Realty Company) upheld the constitutionality of zoning authority to provide for public welfare through the separation of land uses.
- The SCPEA included: (1) the organization and power of the planning commission, which was directed to prepare and adopt a "master plan"; (2) the content of the master plan for the physical development of the territory; (3) provision for adoption of a master street plan by the governing body; (4) provision for approval of all public improvements by the planning commission; (5) control of private subdivision of land; and (6) provision for the establishment of a regional planning commission and a regional plan.
- **National Forest Management Act.** Planning for the management and use of National Forest System (NFS) land must conform to the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974 (16 U.S.C. 1601-1614) (RPA), as amended by the National Forest Management Act of 1976 (16 U.S.C 1601-1614; PL 94-588) (NFMA), implementing regulations found in 36 CFR Part 219, NEPA, and implementing regulations found in 40 CFR 1500-1508.

  The land and resources management plan for the CNF is contained in the following documents: (1) “Land Management Plan – Part 1 Southern California National Forests Visions: Angeles National Forest, Cleveland National Forest, Los Padres National Forest, San Bernardino National Forest”; (2) “Land Management Plan – Part 2 Cleveland National Forest Strategy”; (3) the “Land Management Plan – Part 3 Design Criteria for Southern California National Forests: Angeles National Forest, Cleveland National Forest, Los Padres National Forest, San Bernardino National Forest”; and (4) “Record of Decision – Cleveland National Forest Land Management Plan”[15] (Forest Plan). As specified, one of the goals of the Forest Plan is to “[h]elp meet energy resource needs, objective 1.”[16] One “designated utility corridor” (i.e., Valley-Serrano), which constitutes SCE’s existing 500 kV Valley-Serrano transmission line, is identified therein.17

[14]/ Federal Aviation Administration, Aeronautical Information Manual: Official Guide to Basic Flight Information and ATC Procedures, February 16, 2006, Section 2-2-3.

[15]/ United States Forest Service, Part 1 Southern California National Forests Visions: Angeles National Forest, Cleveland National Forest, Los Padres National Forest, San Bernardino National Forest, R5-MB-075, September 2005; United States Forest Service, Land Management Plan – Part 2 Cleveland National Forest Strategy, R5-MB-077, September 2005; United States Forest Service, Land Management Plan – Part 3 Design Criteria for Southern California National Forests: Angeles National Forest, Cleveland National Forest, Los Padres National Forest, San Bernardino National Forest, R5-MB-080, September 2005; United States Forest Service, Record of Decision – Cleveland National Forest Land Management Plan, R5-MB-077, September 2005, reissued April 2006.

[16]/ United States Forest Service, Land Management Plan – Part 2 Cleveland National Forest Strategy, R5-MB-077, September 2005, p. 112.

[17]/ *Id.*, Table 485, p. 14.

In describing "suitable land uses," the Forest Plan notes that "[l]and use zones (CFR 219.11[c]) were used to map the Cleveland National Forest for the purpose of identifying appropriate management types of 'uses' that are consistent with the achievement of the desired conditions described in Part 1 of the revised forest plan. These land use zones are used to help demonstrate clearly management's intent and to indicate the anticipated level of public land use in any area Place[18] of the National Forest. The activities that are allowed in each zone are expected to result in progress along the pathway toward the realization of the desired conditions. National Forest land use zoning is similar in concept to the zoning models that are being used by counties or municipalities throughout southern California."[19] A partial listing of designated suitable commodity and commercial uses in the CNF, by land use zone, is presented in Table E.9-1. Special use permit proposals are "suitable if they are consistent, or can be made consistent through mitigation and design factors, with the applicable LMP [Forest Plan] standards.[20]

Table E.9-1: Cleveland National Forest Suitable Commodity and Commercial Uses

Land Use Zone	Developed Area Interface (DAI)	Back Country (BC)	Back Country Motorized Use Restricted (BCMUR)	Back Country Non-Motorized (BCNM)	Critical Biological (CB)	Wilderness (W)
Disposal of NFS Lands	By Exception1	By Exception1	By Exception1	By Exception1	By Exception1	Not Suitable
(Non-Rec) Special Use Low Intensity	Suitable	Suitable	Suitable	By Exception1	By Exception1	By Exception1
Major Utility Corridor	Designated Areas	Designated Areas	Designated Areas	Not Suitable	Not Suitable	Not Suitable
Road Construction or Reconstruction	Suitable	Suitable	Suitable for Authorized Use	Not Suitable	Not Suitable	Not Suitable
Developed Facilities	Suitable	Suitable	Not Suitable	Not Suitable	Not Suitable	Not Suitable
Renewable Energy Resources	Suitable	Suitable	By Exception1	By Exception1	Not Suitable	Not Suitable

Notes:

1. By Exception = Conditions which are not generally compatible with the land use zone but may be appropriate under certain circumstances.

Source: USDA Forest Service

[18]/ The Forest Plan has a "place-based program emphasis," whereby the CNF is subdivided into distinct geographic units called "places." Within the TRD, the Project's sites are located within the "Elsinore Place."

[19]/ Op. Cit., Land Management Plan – Part 2 Cleveland National Forest Strategy, p. 2.

[20]/ Correspondence from Peggy Hernandez, Acting Forest Supervisor, Cleveland National Forest to Billie Blanchard, California Public Utilities Commission, File Code 2720/1950, March 16, 2007.

- **California Natural Community Conservation Planning Act.** Under the California Natural Community Conservation Planning Act, the California Resources Agency began implementing a pilot program in 1991 for the protection of coastal sage scrub habitat. The pilot program organized five counties in southern California, including San Bernardino and Riverside Counties, into eleven planning subregions, which were further subdivided into subareas. Each subregion and subarea must design its own habitat conservation plan (HCP) for endangered species, which is then submitted to the USFWS under the NCCP. When approved, these plans allow local communities to manage endangered species on specified reserve areas without having to seek additional take permits from the USFWS.
- **California Public Resources Code.** In Senate Bill 1059 (SB1059), signed by the Governor on September 29, 2006, added Chapter 4.3 (commencing with Section 25330) to Division 15 of the PRC, the Legislature found and declared that: (1) California currently lacks an integrated, Statewide approach to electric transmission planning and permitting that addresses the state's critical energy and environmental policy goals; (2) planning for and establishing a high-voltage transmission system is vital to the future economic and social well-being of California; (3) it is in the interest of the State to identify the long-term needs for electrical transmission corridor zones within the State; and (4) it is in the interest of the State to integrate transmission corridor zone planning at the State level with local planning. The route of the gen–tie is specifically identified in the DOE's "Draft National Interest Electric Transmission Corridor Designations" (Docket No. 2007-OE-02), as released on April 27, 2007. The CPUC's CEQA document could be used by the CEC as the environmental basis for formal designation of the proposed transmission alignment as a "transmission corridor zone" under SB1059.
- **California Code of Regulations**. Section 14000-14010 in Division 1 of Chapter 13 in Title 5 of the CCR outlines minimum standards for school site selection. As specified therein, the property line of the site shall be at least the following distance from the edge of respective power line easements: (1) 100 feet for 50-133 kV line. (2) 150 feet for 220-230 kV line. (3) 350 feet for 500-550 kV line (5 CCR 14010[c]). In addition, the site shall not be located near an above-ground water or fuel storage tank or within 1500 feet of the easement of an above ground or underground pipeline that can pose a safety hazard as determined by a risk analysis study, conducted by a competent professional, which may include certification from a local public utility commission (5 CCR 14010[h]). The school district shall consider environmental factors of light, wind, noise, aesthetics, and air pollution in its site selection process (5 CCR 14010[q]).
- **California Public Utilities Code**. As specified under Section 21670 in Division 9, Part 1, Chapter 4 of the PUC, the Legislature declares that it is in the public interest to provide for the orderly development of each public use airport and the area surrounding the airport. Every county in which there is located an airport which is served by a scheduled airline shall establish an airport land use commission. Each commission shall formulate and adopt an airport land use compatibility plan (Section 21675). If an airport does not have an approved comprehensive land use plan (CLUP) in place, the airport influence area is the area within two miles of the boundary of the airport (Section 21675.1).

  Section 21658 states: "No public utility shall construct any pole, pole line, distribution or transmission tower, or tower line, or substation structure in the vicinity of the exterior boundary of an aircraft landing area of any airport open to public use, in a location with respect to the airport and at a height so as to constitute an obstruction to air navigation, as an obstruction is defined in accordance with Part 77 of the Federal Aviation Regulations, Federal Aviation Administration, or any corresponding rules or regulations of the Federal Aviation Administration, unless the Federal Aviation Administration has determined that the pole, line, tower, or structure does not constitute a hazard to air navigation." Section 21659(a) further states: "No person shall construct or alter any structure or permit any natural growth to grow at a height which exceeds the obstruction standards set forth in the regulations of the

Federal Aviation Administration relating to objects affecting navigable airspace contained in Title 14 of the Code of Federal Regulations., Part 77, Subpart C, unless a permit allowing the construction, alteration, or growth is issued by the department."

As extracted from the "California Advisory Handbook for Community and Military Compatibility Planning," illustrated in Figure 4.11.2-5 (Military Operations Areas and Military Training Routes - South Southern California) is that portion of the Project area located in proximity to Camp Pendleton and Naval Weapons Station, Fallbrook Detachment. Consultation with the Department of the Navy and United States Marine Corps is, therefore, required. Camp Pendleton has three types of Special Use Airspace (SUA) approved by the FAA and charted on aviation maps for the purpose of supporting the military training operations at the base.

9.3 Proposed Land Uses Within Project Boundary

Since the proposed project includes a number of individual component parts, the following description of proposed land uses within and abutting the project boundaries that would occur as a result of the project's development and operation is presented in the context of each of those components, whether located within or outside the National Forest's Congressional boundaries.

9.3.1 Proposed Upper Reservoir Site

Project development would result in the construction of an approximately 100-acre reservoir within the TRD of the CNF. Although the reservoir would be fenced and no public access to that facility would be authorized, a paved maintenance road would encircle the reservoir The maintenance road could provide additional ADA-access to the National Forest, if approved for such use by the TRD.

Following the completion of construction operations, the Applicant could recontour the construction laydown area associated with the upper reservoir and revegetate using a native plant palette. Alternately, the site could be used for Forest purposes by the TRD.

9.3.2 Proposed Powerhouse Site

The 30-acre Santa Rosa powerhouse site at the base of the Elsinore Mountains, within the the CNF, the project proponent would construct a primarily underground silo-style powerhouse with an above ground substation/switchyard.

The associated tailrace and intake structures will connect the powerhouse to Lake Elsinore. With the exception of the surge shaft, the penstocks connecting the powerhouse to the forebay would be constructed underground. Adjoining land uses within and adjoining the TRD would generally include open space areas and existing single-family residences.

Adjacent or proximal to the selected powerhouse, on lands outside the National Forest boundaries, if acceptable to local residents. the project proponent proposes to construct an approximately 20-acre community or neighborhood park. The park site would be fully improved by the project proponent with a variety of recreational facilities. Based on the powerhouse and park site selected, proximal land use would consist of single- and multi-family residential units, an existing elementary school, neighborhood-servicing commercial uses, and undeveloped open space areas.

9.3.3 Proposed Primary Transmission Alignment

The transmission line will traverse privately owned land south of the I-15 Freeway. Proximal land uses include an existing clay mining area, a number of residential areas, and a nudist camp. To the north of the I-15 Freeway, the transmission line would connect to a proposed substation located on private property.

9.3.4 Proposed Low-Voltage Transmission Alignment

The proposed 115-kV transmission line would utilize existing overhead transmission lines, modify existing poles, and/or construct new poles if required to accommodate new distribution facilities. All existing, modified, or new poles would remain within the public right-of-way.

9.4 Maps and Graphics

Aerial photographs, maps, drawings or other graphics sufficient to show the location, extent and nature of the land uses referred to in this section are contained in Exhibit G.

9.5 Impacts on Planning, Population and Services

9.5.1 Potential Impacts on Land Use and Planning

Impacts on land use and planning attributable to LEAPS are discussed in Section 9.3.1.1. Impacts on land use and planning associated with the primary transmission lines are presented in Section 9.3.1.2. Potential cumulative impacts on land use and planning relating to the Project (inclusive of both transmission and generation) are presented in Section 9.3.1.4.

9.5.1.1 Land-Use and Planning

In accordance with its enabling legislation, the USDS Forest Service is authorized to permit non-forest and non-recreational land uses on NFS lands. Lands within CNF are managed by the USDS Forest Service according to the vision, strategy, and design criteria laid out in the “Cleveland National Forest Land Management Plan” (USFS, 2005b). Electrical generation is identified as authorized uses therein. The Decker Canyon Reservoir would be located in a “Back Country, Motorized Use Restricted (BCMUR)” land-use zone. The BCMUR zone includes areas that are undeveloped, with few roads. The zone allows for a range of low-intensity uses and the management intent is to retain the natural character of the zone and limit the level and type of development. The intent is to manage the zone for no increase in road system development.

The Powerhouse, construction laydown areas, and those portions of the electrical and water conduits, including power shafts, power tunnels, and penstocks not located in the National Forest are located in unincorporated Riverside County. A portion of the tailrace tunnel and both the inlet/outlet structure and Lake Elsinore are located in the City of Lake Elsinore. Land-use activities in the County of Riverside may be subject to compliance with the “Riverside County Comprehensive General Plan” (County of Riverside, 2005). Similarly, land-use activities in the City of Lake Elsinore may be subject to compliance with the “City of Lake Elsinore General Plan” (City of Lake Elsinore, 1990).

Table E.9-2 summarizes the potential land use and planning impacts of the Project.

Table E.9-2: Land-Use and Planning Impacts

Impact	Description
L-1	Construction would temporarily disturb land uses at or near the alignment or proposed facility.
L-2	Presence of a transmission line or substation would divide an established community or disrupt land uses at or near the alignment.

Source: The Nevada Hydro Company, Inc.

Table E.9-3: FERC Environmental Measures - Land Use and Planning Impacts

Measure	Description
	The Nevada Hydro Company - Protection, Mitigation, and Enhancement Measures Final Environmental Impact Statement, Project No. 11858 (Section 2.3.6)
L-1 (PME-30)	Acquire and modify the multi-family residences nearest the powerhouse site (the Santa Rosa Villas in the case of the Santa Rosa powerhouse site, provide relocation assistance, use properties for construction purposes or retain in vacant condition, and return to the regional housing inventory upon completion of construction to address potential adverse effects on residents during construction.
L-2 (PME-31)	Acquire fee simple or leasehold interests in lands needed for project purposes by voluntary sale or conveyance to the extent possible.

Source: The Nevada Hydro Company, Inc.

Impact L-1: Construction would temporarily disturb land uses at or near the alignment.

The construction staging area for the Powerhouse is located in close proximity to an occupied 12-unit apartment building (Santa Rosa Mountain Villa Apartments). Because of its proximity to the active construction area, the Applicant has indicated the intent to acquire that multi-family use in order to minimize potential construction-term impacts to its residents. Assuming full occupancy, up to 12 existing households would be displaced by that action. As proposed, the building would be retained and used as offices and/or employee housing during construction. After the commencement of operations, the property would be refurbished and disposed, reducing Project-related impacts on the regional housing inventory.

The proposed tailrace tunnel from the powerhouse site to Lake Elsinore would be constructed underground, in part beneath Grand Avenue, and would affect a parcel with a single-family home and a number of vacant parcels zoned for residential use located between Grand Avenue and the existing shoreline. Construction of the tunnel would require the introduction and use of heavy equipment and personnel in the area of this mix of vacant and residential properties. As proposed, one single-family home would be acquired and on-site structures demolished.

Butterfield Elementary Visual and Performing Arts Magnet School and the Ortega Trails Youth Center (16275 Grand Avenue, Lake Elsinore) are located within about 1,000 feet of the Powerhouse site. Construction activities, including blasting, could disrupt educational activities for school-age children. Heavy equipment operations, including the on-site and off-site transport of materials, could increase safety hazards to children and other pedestrians. TACs, including diesel PM, would be generated on the construction site and along travel routes (including Grand Avenue) traversed by construction-related vehicles.

Land-use impacts, including the displacement of existing residents, a reduction in the available housing inventory, and short-term impacts on an existing elementary school and youth center, could be potentially significant but would be mitigable to a less-than-significant level (through implementation of Applicant's proposed protection, mitigation, and enhancement measures identified in the FEIS.

For residences greater than 1,000 feet from Project facilities, construction-related impacts would be adverse but less than significant due to their separation distance.

Impact L-2: Presence of a transmission line or substation would disrupt land uses at or near the alignment.

The proposed Powerhouse site is designated "Medium Density Residential" in the "Riverside County Comprehensive General Plan" (County of Riverside, 2005). Low-rise development would be generally compatible with this designation.

As proposed, the Powerhouse will be mostly constructed below ground but will include an approximately three-story building constructed aboveground for access to the powerhouse and for communication and heating, ventilation, and air conditioning (HVAC) equipment. The area around the structure will be landscaped and set back from Grand Avenue, thus reducing its visibility. Much of the site will be retained as open space and a neighborhood park or, if neither the City of Lake Elsinore nor the County of Riverside where to accept dedication of the site for park use, the Applicant retains the right to development another non-residential land use along Grand Avenue. Once landscaped, the Powerhouse would receive regular operations and maintenance use on a scale generally consistent with existing neighboring and proximal uses. This is a less-than-significant impact and no mitigation is required.

9.5.1.2 Primary Transmission Lines Impacts – Land-Use and Planning

The entire length of the proposed primary transmission line is located within the City of Lake Elsinore or unincoprated area of Riverside County.

Except where otherwise precluded, those portions of the primary transmission lines that are not located on federal lands may be subject to the jurisdiction of the following local land-use entities:

Riverside County. Portions of the primary transmission line, including the Santa Rosa Substation, would be located in unincorporated areas of Riverside County within the sphere of influence of the City of Lake Elsinore. The northern segment of the primary transmission line would be located in unincorporated Riverside County.

City of Lake Elsinore. Lake Elsinore, portions of the electrical and water conduits (e.g., power shafts, power tunnels, penstocks, tailrace tunnels, and inlet/outlet structures) associated with the Project are located in the City of Lake Elsinore.

Table E.9-4 summarizes the potential land-use and planning impacts of the primary transmission lines. The primary transmission line is examined below.

Table E.9-4: Primary Transmission Lines – Land-Use and Planning Impacts

Impact	Description
L-1	Construction would temporarily disturb land uses at or near the alignment or proposed facility.
L-2	Presence of a transmission line or substation would divide an established community or disrupt land uses at or near the alignment.

Source: The Nevada Hydro Company, Inc.

Impact L-1: Construction would temporarily disturb land uses at or near the alignment or proposed facility.

For residences within a 1,000-foot radius located along the primary transmission line route the construction of the primary transmission lines could temporarily disturb or intrude upon surrounding areas and proximal land uses as a result of the use of heavy equipment, construction activities (including associated earthwork), the importation and exportation of material, manpower, and equipment. Those activities would generate dust, air contaminants, and noise affecting proximal receptors.

Impact L-2: Presence of a transmission line or substation would disrupt land uses at or near the alignment.

Construction of the primary transmission line would introduce transmission facilities and create a transmission right-of-way in areas where those uses may or may not currently occur. Once construction is completed, at least along the primary transmission alignment, those areas would rapidly return to their pre-construction uses.

From an operational and maintenance perspective, the primary transmission lines would not disrupt actual use of residential properties or structures. Access to all uses and adjoining areas would be fully restored once construction was completed. The primary transmission line would not permanently cause the nature or condition of any use to change. For these reasons, operational land-use and planning impacts would be less than significant and no mitigation is required.

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E
ENVIRONMENTAL REPORT SECTION 10
ALTERNATIVE LOCATIONS, DESIGNS AND ENERGY SOURCES

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

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Federal Energy Regulatory Commission
Project Number: P-14227
October 2022

Approval for issue		
Paul Anderson		2022-10-20

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EXHIBIT E – SECTION 10
DESCRIPTION OF PROJECT ALTERNATIVES

As required under 18 CFR 4.41(f)(10), the Applicant (all references to the Applicant herein refer to The Nevada Hydro Company, Inc.) must describe alternative locations, designs, and energy sources, including the following:

(i) Alternative sites considered in arriving at the selection of the Proposed Project site;

(ii) Alternative facility designs, processes, and operations that were considered and the reasons for their rejection;

(iii) Alternative electrical energy sources, such as gas, oil, coal, and nuclear-fueled power plants, purchased power or diversity exchange, and other conventional and pumped-storage hydroelectric plants; and

10.0 INTRODUCTION TO THE ALTERNATIVES ANALYSIS

As noted throughout this application, the proposed Bluewater Renewable Energy Storage Project (the "Proposed Project") described herein is largely identical to the project previously applied for under the Federal Energy Regulatory Commission ("FERC" or the "Commission") Docket 14227 and that described in the Final Environmental Impact Statement prepared by the Commission and the U.S Forest Service[1] ("FEIS") for project number P–11858.

In this section, the Applicant describes all reasonable alternatives to the project or to the location of the project which could feasibly attain the basic objectives of the project and state why they are rejected in favor of the ultimate choice. As a California project ultimately to be assessed under the provisions of the California Environmental Quality Act ("CEQA"), a "no project" alternative must also be evaluated, along with its impact. The discussion of alternatives is to include alternatives capable of substantially reducing or eliminating any significant environmental effects, even if these alternatives substantially impede the attainment of the Proposed Project's objectives and are more costly.

As a result, this Section contains updated and enhanced information prepared to meet the needs of the California State Water Resources Control Board, the agency responsible for issuing the Clean Water Act Section 401 Certification for the project.

For purposes of the Water Board's analysis of the project, the Company filed with the California Public Utilities Commission ("CPUC") a "Proponent's Environmental Assessment" ("PEA"). The PEA served as the basis for creation of the applicant prepared EIR, much like the Commission uses this information presented in this Application as the basis for its own EIS. This link is to the CPUC's web site where Nevada Hydro's PEA, as accepted by the CPUC as complete in 2011, may be found. It is referenced explicitly herein to aid the Commission in preparing a joint EIS/EIR with the Water Board, if it so chooses.

10.1 Project Goals and Objectives

A pumped storage project requires a number of specific component parts. Among those, there must exist or there must exist the ability to construct both an upper (forebay) and lower (afterbay) reservoir in close proximity to one another and, separated by sufficient height differential (head) to effectively generate hydroelectric energy. In describing pumped storage hydropower, FERC notes that this type of project is particularly effective at sites having high heads, defined as a large difference in elevation between the upper and lower reservoirs.

In 1990, the Tudor Engineering Company (TEC) published a reconnaissance-level investigation which identified the potential to construct a pumped storage hydropower project in the Santa Ana Mountains (Elsinore Mountains), in proximity to Lake Elsinore. As indicated therein, "[p]umped storage units are used by various utilities to mitigate the effects of daily peaking problems. The southwest region of California, however, has few sites that can be utilized for

[1]/ Federal Energy Regulatory Commission and United States Department of Agriculture, United States Forest Service, Trabuco Ranger District, Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, FERC/EIS-0191F, January 2007. This may be found in Volume 3.

pumped storage, either because of insufficient or varying water supplies or an unacceptable elevation between the upper and lower reservoirs."[2]

The geographic area identified in the TEC study represents the only suitable location in the general vicinity of the Proposed Project which possesses an existing water body of sufficient size to serve as a pumped storage facility, substantial elevation differences (delta) over a relative short distance to allow for the operation of a large-scale pumped storage project, and proximity to large metropolitan areas with identified energy needs. Since those physiographic and locational conditions are not readily reproducible, the Lake Elsinore area represents the only known locale in southern California that can accommodate a pumped storage facility sufficient to accommodate large power levels and long discharge times.

Unlike an idea or a product that can be taken from its source of origin, produced, exported, and then assembled in any of a wide range of distant areas, pumped storage is dependent upon the existence of definable variables that impose real-world restrictions on its duplication and wide-scale application. As such, the primary goals of the Proposed Project are to: (1) take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage hydropower facility; and (2) connect the pumped storage facility to the CAISO-controlled grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas. Based on those primary goals, a number of Project-specific objectives have been formulated and described in detail in the Application. Because they serve as the basis for identification of Project alternatives, the Project's objectives are repeated below.

The objectives of the "pumped storage component" of the Proposed Project include:

1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of hydropower generators as needed during peak-demand hours.
2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).
3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.
4. Provide 500 MW of black start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.
5. Provide voltage support and other "ancillaries" for the eastern SCE service area and wind energy integration in the southern California electrical region.
6. Provide the flexibility to pump from, or generate power to either the SCE or SDG&E systems.

As summarized in Table E. 10-1 Alternatives' Ability to Attain Stated Goals and Objectives, the "Applicant's Proposed Project" and five alternatives (inclusive of a "No Project/No Build" Alternative), as recommended by the Applicant for advancement herein, have been examined in

[2]Tudor Engineering Company, Report on Reconnaissance Level Investigation of Lake Elsinore Pumped Storage Project, June 1990, p. 1-2.

the context of each alternative's potential ability to fulfill, either in whole or in part, the goals and objectives identified herein. As presented in that table, the following symbols have been used to reflect the degree to which each alternative serves to fulfill, in whole or in part, the Project's stated goals and objectives:

●	Alternative allows for "full attainment" of the stated goals or objectives
○	Alternative may allow for "partial attainment" of the stated goals or objectives
-	Alternative would not allow for the attainment of the stated goals or objectives

Each of these nominated alternatives, as well as other alternatives considered but eliminated from further consideration by the Applicant (including the reasons for the rejection of those alternatives), are more thoroughly described below.

For the purposes of this evaluation, we have included the goal of interconnection with both SDGE and SCE, however at this time we have deferred the interconnection with SDGE and have not included that in our application. We have noted the interconnection to SDGE as "partial attainment", since the project will be configured to provide the option for future interconnection depending on market conditions and other considerations.

Table E. 10-1 Alternatives' Ability to Attain Stated Goals and Objectives

Goals and Objectives	Applicant Proposed Project	Alternatives: 1. Alternate Interconnection Location	2. Alternate Transmission Routing	3. Alternate Interconnection to SDGE	4. Alternate Transmission Line Technologies	5. No Project/No Build
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	●	●	●	●	●	-
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	○	○	○	○	○	-
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	●	●	●	●	●	-
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	●	●	●	●	●	-
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	●	●	●	●	●	-
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	●	●	●	●	●	-
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	●	●	●	●	●	-

Source: The Nevada Hydro Company

10.2 Alternatives Considered but Eliminated from Further Analysis by the Applicant

10.2.1 "Non Wires" Alternative

The United States Department of Energy (DOE) recognizes "most of California is currently a generation-short load pocket." Because it is frequently difficult to site and build efficient new generation or additional transmission within urban areas, the load pocket will often experience congestion, meaning that "it cannot import as much low-cost energy as it would like, and the city's electricity provider(s) must operate one or more existing power plants inside the city more intensively to ensure that all customer needs are met, although at higher cost. If electricity demand inside the load pocket grows quickly without being checked by energy efficiency and demand response, the load pocket may be facing a looming reliability problem, with too little supply (local generation plus transmission-enabled imports) relative to demand – whether in actual terms or according to accepted rules for safe grid operation. In such cases, it is necessary for the transmission owner(s) serving the load pocket to resolve the reliability problem as quickly as possible. In the case of a load pocket, there are three primary ways to deal with a long-term congestion problem: (1) Build new central-station generation within the load pocket; (2) Build new or upgrade transmission capacity to enable distant generators to serve a portion of the area's load; or (3) reduce electricity demand within the load pocket, through some combination of energy efficiency, demand response and distributed generation."[3]

The Proposed Project involves one of the three DOE-identified strategies for addressing long-term congestion problems, new generation (pumped storage).[4] Since the third strategy (reduce electricity demand) represents a possible alternative to the Project, its potential application was considered by the Applicant.

As indicated by the California Energy Commission (CEC): "When an inadequacy is identified in the power transmission grid, the problem can often be solved in a variety of different ways. The installation of a new transmission line to move electricity from one place to another is one way of solving that problem. However, at various points in the transmission planning process, alternative means of solving the problem are considered. These options generally include the following: [1] Different transmission line routes, different tower designs, and installation of lines either overhead or underground. All of these options are still transmission lines, but with varying types and extents of environmental impacts and widely varying cost. [2] Generation can reduce or eliminate the need for transmission lines. Generation includes gas, coal, or nuclear-powered power plants, as well as renewable energy technologies (solar, wind, geothermal, biomass, hydro, and tidal power). [3] Electricity storage could reduce the need to import power to an area

[3]/ United States Department of Energy, National Electric Transmission Congestion Study, August 2006, p. 4.

[4]/ In "Order of Rate Request," dated November 17, 2006, the FERC published the following determination: "With regards to whether the LEAPS facility meets the requirements of section 1223 of EPAct, we find that it does. Section 1223 of EPAct 2005 declares pumped hydro an 'advanced transmission technology' that this Commission should encourage, as appropriate. Nevada Hydro's LEAPS facility meets the requirements of this section." Section 1223 defined an advanced transmission technology as "a technology that increases the capacity, efficiency, or reliability of an existing or new transmission facility." Under that order, the Project's generation (pumped storage) component has been federally declared an "advanced transmission technology." As such, pumped storage could be categorized as both a "transmission" facility or as a "generation" asset.

of load. [4] Conservation (demand-side management) can reduce demand for power, thus reducing or eliminating the need for new transmission lines.”[5]

The CEC reports that the State of California had a total generation of 277,764 gigawatt-hours (GWh) in 2021, up 2 percent, or 5,188 GWh, from 2020. ·Consumption is growing two percent annually. Peak demand demand of 52,061 megawatts occurred on September 6, 2022, with widespread rolling blackouts narrowly avoided due to conservation efforts, though several thousand customers in Palo Alto and Alameda had their power cut when the California Independent System Operator told those cities' municipal power companies to shed load. Peak demand continues growing at about 2.4 percent per year, roughly equivalent to three new 500 megawatt power plants per year. This demand will need to be met by increased generation, but generation cannot always be located in areas of greatest demand, resulting in a requirement for transmission. Major transmission lines are increasingly difficult to site, so consideration of other alternatives is critical. Non-transmission alternatives (also called ‘non-wires’ alternatives) are those that do not involve major transmission lines and are one way to respond to this load growth. Renewable energy and fossil fuel generation, if they can be produced near the location where they would be used, are potential non-wires alternatives. In addition, DSM [demand-side management] or conservation, electricity storage, and distributed generation (DG) can reduce the need for a transmission project and thus are also considered as non-wires alternatives.[6]

As indicated in the CEC’s “Energy Action Plan II – Implementation Roadmap for Energy Policies” (EAP II), with regards to the State’s “priority sequence for actions,” the “loading order identifies energy efficiency and demand response as the State’s preferred means of meeting growing energy needs. After cost-effective efficiency and demand response, we rely on renewable sources of power and distributed generation, such as combined heat and power applications.”[7]

As part of this evaluation, the Applicant considered whether one or more non-wires options could be undertaken as a potentially feasible option to the construction of new generation (pumped storage) and/or transmission facilities. Possible “non-wires” alternatives examined by the Applicant included distributed generation (DG), energy-efficiency (EE) measures, and demand-response (DR) strategies. Presented below is a brief summary of those “non-wires” alternatives and the Applicant’s rationale for not including those alternatives herein.

10.2.1.1 “Distributed Generation” Alternative

DG is a parallel or stand-alone electric generation unit generally located at or near where the energy is being consumed. Self-generation refers to DG technologies that are installed on the customer’s side of the meter to provide electricity to the customer for a portion of its load. The

[5]/ California Energy Commission (Aspen Environmental Group), Comparative Study of Transmission Alternatives: Background Report, 700-04-006, June 2004, pp. 2-3.

[6] Ibid., p. 5.

[7] California Energy Commission and California Public Utilities Commission, Energy Action Plan II – Implementation Roadmap for Energy Policies, September 21, 2005, p. 2.

CPUC has long recognized the value of DG in the resource planning and energy procurement context and has made a substantial effort to encourage the installation of DG in California.[8]

> As defined by the CEC: "DG refers to stationary applications of electric generating technologies which are smaller than 50 MW of net generating capacity, the [California] Energy Commission's power plant siting jurisdiction threshold. They may be owned by electric or gas utilities, by industrial, commercial, institutional or residential energy consumers, or by independent energy producers. They include generating technologies such as diesel engines, fuel cells, small and micro gas turbines, solar PV [photovoltaics], and wind turbines, and may be combined with electric storage technologies such as batteries and flywheels."[9]
>
> The Applicant notes that flywheels are not technologically and/or economically feasible at a scale sufficient to provide energy storage capacity comparable to that of the Proposed Project.
>
> DG generally refers to "electric power generation within the distribution network or on the customer side of the meter."[10] DG technologies are considered to be "behind the meter" if residential, commercial, or industrial customers implement them to reduce the amount of electricity they purchase from the distributing utility.[11] DG can substitute for other investment in transmission circuits and large generation if a sufficient amount of distributed generation is operating during peak-load periods. The challenge for DG is to reliably provide sufficient capacity at the right time to mitigate overloads.[12] DG applications include emergency and stand-by generators and battery systems to supply back-up electric power for critical loads in the event of a power outage, co-generation and renewable energy systems installed to augment utility power supplies and, if grid connected, to sell power, remote or off-grid electric loads.[13]
>
> DG can serve to reduce loading and use on transmission lines,[14] improve reliability by adding generation capacity at the customer site for continuous power and backup supply, add system generation capacity, free up addition system generation, transmission, and

8 California Public Utilities Commission, PUC Allows Distributed Generation Facility Owners To Retain Renewable Energy Credits, Docket No. R.06-03-004, January 11, 2007.

9 California Energy Commission, Distributed Generation: CEQA Review and Permit Streamlining, P700-00-019, December 2000, p. 10.

10/ Ackermann, T., Anderson, G., and Soder, L., Distributed Generation: A Definition, Electric Power Systems Research, Vol. 57, pp. 195-204.

11 If a technology is "behind the meter," its energy output reduces the amount of electricity purchased from the distribution utility.

12/ Energy and Environmental Economics, Inc. and Bonneville Power Administration, Olympic Peninsular Study of Non-Wires Solutions to the 500 KV Transmission Line from Olympia to Shelton and a Transformer Addition at Shelton, Draft, January 12, 2004, pp. 11 and 13.

13 California Energy Commission, Distributed Generation: CEQA Review and Permit Streamlining, P700-00-019, December 2000, pp. 1 and 15.

14 Office of Ratepayer Advocates, Tipping Point Analysis and Attribute Assessment for DPV2, Testimony of Lon W. House, California Public Utilities Commission, November 22, 2005, p. 34.

distribution capacity, relieve transmission and distribution system bottlenecks, and support power system maintenance or restoration operations with generation of temporary backup power.[15]

Despite its many benefits, as indicated in **Table E. 10-2. "Distributed Generation" Alternative - Ability to Attain Stated Goals and Objectives**, a DG alternative does not appear to allow for the attainment of the Proposed Project's two stated goals, does not appear to allow for the attainment of at least four of the seven "transmission component" objectives, and does not appear to allow for the attainment of at least three of the five "pumped storage component" objectives. Of those objectives that may be fulfilled, only partial attainment of the remaining objectives could, at best, be realistically achieved.

Although DG may reduce load, it will not serve to provide additional high-voltage capacity to reduce congestion on the CAISO grid. DG technologies will not improve import capacity to the Los Angeles or San Diego load area, provide a new 500-kV interconnection, or provide the Project with access to the CAISO-controlled grid. Similarly, DG fails to provide any of the ancillary benefits associated with pumped hydro storage and will not allow for the fortification and/or enhancement of localized electrical facilities and systems.

This alternative does not improve transmission access to the location-constrained Proposed Project, does not provide a mechanism for the storage of renewable, nor does it provide the other attributes pumped hydro can provide. Similarly, the selection of a "distributed generation" alternative would not facilitate the expansion of the State's backbone transmission and generation systems. As a result, a potential DG alternative was rejected because effectuation is deemed to be infeasible[16] by the Applicant since implementation would be subject to the actions of other parties and because the Applicant has no reasonable ability to or expectations for the imposition of control or influence over the actions of those parties. As such, this alternative could not be reasonably effectuated by the Applicant.

10.2.1.2 "Energy Efficiency Measures" Alternative

As indicated by the CEC and CPUC, "cost effective energy efficiency is the resource of first choice for meeting California's energy needs. Energy efficiency (EE) is the least cost, most reliable, and most environmentally-sensitive resource, and minimizes our contribution to climate change."[17]

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15 Arthur A. Little, Reliability and Distributed Generation, 2000, p. 16.

16 The State CEQA Guidelines define "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (14 CCR 15364). Since the Applicant's proposed advanced pumped storage technology does not lend itself to broad geographic application and, even if an alternative technology were to be considered, the Applicant lacks a mechanism to implement a broad-based and decentralized application of that technology, there exists economic, environmental, legal, social, and technological reasons for the rejection of this and other similar alternatives herein.

17/ California Energy Commission and California Public Utilities Commission, Energy Action Plan II, Implementation Roadmap for Energy Policies, October 2005, p. 3.

Certain conservation (load reduction) measures (such as heating efficiency, weatherization, and energy efficient lighting) can reduce loads and have an impact on peak-demand reductions.[18] However, the challenge with energy-efficiency measures is their ability to achieve a sufficient on-peak load reduction to substantively contribute to the deferral of the need for new generation (pumped storage) or transmission facilities.

The CEC has formulated a set of short-term and long-term goals for Statewide energy-efficiency (EE) programs. In 2015, California set an ambitious goal to achieve a statewide cumulative doubling of energy efficiency savings and demand reductions in electricity, relative to 2015 estimates, by January 1, 2030[19].

Reducing electric demand, through energy efficiency, can defer the need for new generation facilities and transmission lines for varying time periods. However, despite its many benefits, as indicated in **Table E. 10-3. "Energy Efficiency Measures" Alternative - Ability to Attain Stated Goals and Objectives**, an EE alternative does not appear to allow for the attainment of the Project's two stated goals, does not appear to allow for the attainment of at least five of the seven "transmission component" objectives, and does not appear to allow for the attainment of at least four of the five "pumped storage component" objectives. Of those objectives that may be fulfilled, only partial attainment of the remaining objectives could, at best, be realistically achieved.

Although EE may reduce load, it will not serve to provide additional high-voltage capacity to reduce congestion on the CAISO grid. EE measures will not improve import capacity to high demand areas, provide a new 500-kV interconnection, or provide the Proposed Project access to the CAISO-controlled grid. Similarly, EE measures would fail to provide any of the ancillary benefits associated with pumped hydro and will not allow for the fortification and/or enhancement of localized electrical facilities and systems.

This alternative does not improve transmission access to the location-constrained Proposed Project area, or provide a mechanism for the storage of renewable or off-peak energy resources. Similarly, the selection of an "energy efficiency" alternative would not facilitate the expansion of the State's backbone transmission and generation systems.

A potential EE alternative was rejected because effectuation is deemed to be infeasible by the Applicant since implementation would be subject to the actions of other parties and because the Applicant has no reasonable ability to or expectations for the imposition of control or influence over the actions of those parties. As such, this alternative could not be reasonably effectuated by the Applicant.

[18]/ Energy and Environmental Economics, Inc. and Bonneville Power Administration, Olympic Peninsular Study of Non-Wires Solutions to the 500 KV Transmission Line from Olympia to Shelton and a Transformer Addition at Shelton, Draft, January 12, 2004, p. 14.

10.2.1.3 "Demand Response Strategies"

As indicated by the CEC: "By reducing system loads during critical-peak times, demand response [DR] can help reduce the threat of brownouts and blackouts. DR is also widely regarded as having an important role in lowering power costs – and customer bills, by making organized wholesale power spot markets more competitive and efficient and less subject to the abuse of market power. Consequently, there is common agreement among California's energy policy makers, utilities, independent system operators and other interested parties that DR should be a key resource option. The California 'Energy Action Plan II' places DR at the top of the resource procurement loading order with energy efficiency. It specifies that five percent of system peak demand be met by DR in 2007. However, despite significant past and continuing efforts by all of the parties, this goal is unlikely to be achieved."[20]

Reducing electric demand can defer the need for new generation facilities and transmission lines for varying time periods. Electric demand can be reduced through broad strategies that encourage energy efficient appliances and public awareness, to highly technical Internet-based technologies that manage peak load. Load shifting, which is the practice of altering the pattern of energy use so that on-peak energy use is shifted to off-peak periods, is a fundamental demand-side management objective. Incentives can include programs such as receiving lower prices of energy through time-of-day rates offered by the electric utilities.[21]

As indicated by FERC: "Over the years, we have learned repeatedly that people respond to price. In the case of electric power, this is likely to take several forms. First, there is likely to be more demand response. In the simplest terms, high prices at peak will lead some customers – both businesses and others – to prefer to save their money rather than use power. In fact, the first round of demand response may be both the cheapest and fastest way to improve capacity margins on many systems."[22]

As further indicated by SDG&E: "Demand response offers an alternative to maintaining system reliability through capacity additions by providing customers opportunities to participate in demand-side management while seeking to limit the impact of their operation."[23] Most broadly, demand response applies rate design, incentives, and technology to enhance the ability of customers to change demand in response to prices and/or system conditions. DR strategies use real-time meters to track power usage constantly instead of once a month. Real-time meters would not alter how customers are charged but would give customers information about what they were being charged at any given time. Since power costs more during peak than during off-

[20] Faruqui, Ahmad and Hledik, Ryan (The Brattle Group), Draft Consultant Report – The State of Demand Response in California, CEC-200-2007-003-D, California Energy Commission, April 2007, p. 5.

[21] Op. Cit., Comparative Study of Transmission Alternatives: Background Report, pp. 15-16.

[22] Federal Energy Regulatory Commission, Increasing Costs in Electric Markets, Item No. A-3, June 19, 2008, p. 14.

[23]/ San Diego Gas & Electric Company , Supplement to Application of San Diego Gas & Electric Company (U 902-E) for a Certificate of Public Convenience and Necessity for the Sunrise Powerlink, A.05-12-014, December 19, 2005, Appendix V, p. V-v.

peak period, consumers could set-up an automatic system to regulate how much energy they use and when they use it so that their actions would be the most cost effective.

The CPUC (CPUC Docket No. D.01-05-056) has identified the following two general types of demand-response programs that have been used to reduce demand when energy prices are high or when supplies are tight: (1) "price-responsive" programs in which customers choose how much load reduction they can provide based on either the electricity price or a per-kilowatt (kW) or kilowatt-hour (kWh) load reduction incentive; and (2) "reliability-triggered" programs in which customers agree to reduce their load to some contractually-determined level in exchange for an incentive, often a commodity price discount.[24] The CPUC (CPUC Docket No. D.06-03-024) has acknowledged that "both types of programs motivate customers to reduce their loads in exchange for some type of benefit such as reduced energy rates, bill credits, or exemptions from rotating outages."[25]

As indicated in **Table E. 10-4. "Demand Response Strategies" Alternative - Ability to Attain Stated Goals and Objectives**, a DR alternative does not appear to allow for the attainment of the Proposed Project's two stated goals, does not appear to allow for the attainment of at least five of the seven "transmission component" objectives, and does not appear to allow for the attainment of at least four of the five "pumped storage component" objectives. Of those objectives that may be fulfilled, only partial attainment of the remaining objectives could, at best, be realistically achieved.

Although DR may reduce peak load, it will not serve to provide additional high-voltage capacity to reduce congestion on the CAISO grid. DR strategies will not improve import capacity to high demand areas, provide a new 500-kV interconnection, or provide the Proposed Project access to the CAISO-controlled grid. DR fails to provide any of the ancillary benefits associated with pumped hydro and will not allow for the fortification and/or enhancement of localized electrical facilities and systems. In addition, this alternative does not improve transmission access to the location-constrained proposed Project, or provide a mechanism for the storage of renewable or off-peak energy resources. Similarly, the selection of a "demand response" alternative would not facilitate the expansion of the State's backbone transmission and generation systems.

A potential DR alternative was rejected because effectuation is deemed to be infeasible by the Applicant since implementation would be subject to the actions of other parties and because the Applicant has no reasonable ability to or expectations for the imposition of control or influence over the actions of those parties. As such, this alternative could not be reasonably effectuated by the Applicant.

CEQA stipulates that, in general, the alternatives considered for a proposed action need only relate to the project "as a whole," not to its various parts. Agencies, therefore, need not analyze specific alternatives to "parts" of that action. In Big Rock Mesas Property Owners Association v. Board of Supervisors (1977) 73 Cal.App.3d 218, in pertinent part, the court found that "[t]he pertinent statute and EIR guidelines require that an EIR describe alternatives to the proposed

[24] Quantum Consulting, Inc. and Summit Blue Consulting, LLC, Evaluation of 2005 Statewide Large Nonresidential Day-Ahead and Reliability Demand Response Programs, Final Report, April 28, 2006, p. 2-3.

[25] California Public Utilities Commission (Summit Blue Consulting, LLC and Quantum Consulting, Inc.), Protocols for Estimating the Load Impacts from DR Programs, Draft Version 1, April 3, 2006, pp. 3 and 4.

[p]roject. We interpret such requirement as applicable only to the project as a whole, not to the various facets thereof." An EIR's alternatives analysis would not be deemed inadequate if it sufficiently "discusses alternatives to the project in its entirety. The Law requires no more." Similarly, in Local & Regional Monitor v. City of Los Angeles (1993) 16 Cal.App.4th 630, the courts concurred, in pertinent part, that "statutes do not require alternatives to various facets of the project. Rather, the EIR must discuss proposed alternatives to the project as a whole."

Under the Big Rock decision, alternatives based on DG, EE measures, and/or DR strategies do not constitute reasonable alternatives to the "Applicant's Proposed Project" under CEQA since those alternatives do not allow for a comparative analysis of the "project as a whole." A potential variation of a "non-wires" alternative conforming to that decision is, however, identified in Section 6.2.4.4 (Alternative No. 9 - "New In-Area Renewable Generation" Alternative). Under that alternative, other new renewable projects would be developed in the San Diego area not requiring the construction of new transmission lines as the alternative's "primary component."[26]

Table E. 10-2. "Distributed Generation" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	**Ability to Attain Stated Goal or Objective**
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Non-attainment**. Because implementation will occur at remote locations and not include improvements to area's existing backbone systems, DG will not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	**Non-attainment**. Because no improvements to area's existing backbone systems would occur, DG will not facilitate the development of a pumped storage facility.
Objectives	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Partial attainment**. If DG is used in combination with customer-based battery or other storage technologies, off-peak energy could be stored for peak-demand periods.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Non-attainment**. DG does not accommodate regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Non-attainment**. DG does not accommodate regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Non-attainment**. DG does not provide Black Start capacity.

[26]/ California Public Utilities Commission and United States Department of the Interior, Bureau of Land Management, Draft Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58, January 2008, p. E.5-1.

II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Partial attainment**. Although DG could be used to help in the integration of wind energy, localized expansion of wind generators may be infeasible.

Source: The Nevada Hydro Company

Table E. 10-3. "Energy Efficiency Measures" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Non-attainment**. Because implementation will occur at remote locations and not include improvements to area's existing backbone systems, DG will not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	**Non-attainment**. Because no improvements to area's existing backbone systems would occur, DG will not facilitate the development of a pumped storage facility.
Objectives	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Non-attainment**. Although effective at reducing demand, EE does not provide for the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Non-attainment**. EE does not accommodate regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Non-attainment**. EE does not accommodate regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Non-attainment**. EE does not provide Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Partial attainment**. EE can help sustain and keep the electrical system operating to meet long-term load demand.

Source: The Nevada Hydro Company

Table E. 10-4. "Demand Response Strategies" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Non-attainment**. Because implementation will occur at remote locations and not include improvements to area's existing backbone systems, DG will not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	**Non-attainment**. Because no improvements to area's existing backbone systems would occur, DG will not facilitate the development of a pumped storage facility.
Objectives	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Non-attainment**. Although potentially effective at reducing demand, DR does not provide for the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Non-attainment**. DR does not accommodate regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Non-attainment**. DR does not accommodate regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Non-attainment**. DR does not provide Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Partial attainment**. DR can help sustain or keep the electrical system operating to meet long-term load demand.

Source: The Nevada Hydro Company

10.2.2 "Alternative Gen-Tie Route" Alternative [27]

A potential "Alternative Gen–Tie Route" can be drawn from a number of sources, including those presented in the following documents and planning studies:

- Valley-Rainbow Interconnect Project
- Southwest Transmission Expansion Plan
- South Regional Transmission Plan

[27] The consideration of an "alternative transmission route" differs from the subsequent assessment of an "alternative transmission alignment." Under the former option, routes other than those described in the Applicant's FLA, FERC's DEIS, and FERC's FEIS were considered. Under the latter option, some of the alignment variations presented in the Applicant's FLA, FERC's DEIS, and FERC's FEIS are examined

- Devers-Palo Verde Transmission Line Project
- Sunrise Powerlink Project
- SDG&E Sunrise Proposed Project

CEQA stipulates that, in general, the alternatives considered for a proposed action need only relate to the project "as a whole," not to its various parts. Agencies, therefore, need not analyze specific alternatives to "parts" of that action. Under the Big Rock decision described above, alternatives based on alternative generation tie-in alternatives only do not constitute reasonable alternatives to the "Applicant's Proposed Project" under CEQA since those alternatives do not allow for a comparative analysis of the "project as a whole." ."[28] Alternative gen-tie in alternatives was therefore rejected as alternatives to the Project as they do not include power generation or any of the benefits that pumped hydro storage can provide.

By failing to address any of the Project's stated pumped storage goals and objectives, a "Alternative Gen–Tie Route" alternative does not allow for a comparative assessment of Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors) and does not, therefore, constitute a reasonable alternative.

10.2.3 Alternative Generation Alternatives

10.2.3.1 "New In Area Renewable Generation" Alternative

The "New In-Area Renewable Generation" alternative would involve development of various In-Area renewable projects that together could provide sufficient generation capacity to defer the need for projects such as the one proposed.

The "New In-Area Renewable Generation" alternative would not provide a mechanism for the storage of renewable or off-peak energy resources. In addition, as illustrated in Table E. 10-5. "New In-Area Renewable Generation" Alternative - Ability to Attain Stated Goals and Objectives, a "New In-Area Renewable Generation" alternative does not appear to allow for the attainment of the Project's two stated objectives, does not appear to allow for the attainment of at least three of the seven "transmission component" objectives, and does not appear to allow for the attainment of at least four of the five the "pumped storage component" objectives. This alternative appears to allow for the full or partial attainment of four of the seven "transmission component" objectives and one of the "pumped storage" objectives, including those relating to renewable energy resources.

Although constituting a substantially different remedy to the attainment of the Proposed Project's stated purpose and need, the Big Rock decision would be inapposite with respect to a "New In-Area Renewable Generation" alternative because that alternative may provide an alternative method of addressing the purpose and need upon which the Proposed Project is

[28]/ California Public Utilities Commission and United States Department of the Interior, Bureau of Land Management, Draft Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58, January 2008, p. E.5-1.

predicated and may, therefore, allow for a comparative analysis of the "project as a whole." Notwithstanding the CPUC's findings, for the purpose of informed decision making, a "New In-Area Renewable Generation" alternative is further discussed in Section 6.2.4.4 (Alternative No. 9 - "New In-Area Renewable Generation" Alternative).

10.2.3.2 "New in Area All Source Generation" Alternative

The "New In-Area All-Source Generation" alternative would include a combination of fossil-fuel fired central station and peaking generators, renewable generators, and non-renewable distribution generation (DG). Under this alternative, the capacity provided by conventional generation projects would include at least 620 MW from a central station power plant (i.e., South Bay Replacement Project, San Diego Community Power Project, or Carlsbad Energy Center/Encina Power Plant Repowering Project) plus 250 MW from multiple peaking power plants assumed to come online by 2008. This alternative also includes 200 MW of solar photovoltaic, wind, and biomass projects.

This alternative would not improve transmission access to the location-constrained hydroelectric facility, allow for the storage of excess off-peak energy production in the CAISO region, or effectively provide for the integration of intermittent renewable resources. ,

In addition, as illustrated in Table E. 10-6. "New In-Area All-Source Generation" Alternative - Ability to Attain Stated Goals and Objectives, a "New In-Area All-Source Generation" alternative does not appear to allow for the attainment of the Project's two stated goals, does not appear to allow for the attainment of at least one of the seven "transmission component" objectives, and does not appear to allow for the attainment of any of the five "pumped storage component" objectives.

By failing to address any of the Project's stated pumped storage goals and objectives, a "New In-Area All-Source Generation" alternative does not allow for a comparative assessment of Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors) and does not, therefore, constitute a reasonable alternative.

Table E. 10-5. "New In-Area Renewable Generation" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Non-attainment**. This alternative would not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	**Non-attainment**. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Partial Attainment**. Under this alternative, some additional high-voltage transmission capacity would be created.

Goals and Objectives	Ability to Attain Stated Goal or Objective
I.2. Provide at least 1,100 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Partial Attainment**. Although no additional import capacity would be created, new in-basin sources of renewable energy would be developed.
I.3. Provide at least 1,800 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy requirements.	**Partial Attainment**. Although no additional import capacity would be created, reliability criteria could be addressed through the development of new in-basin sources of renewable energy resources.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Non-attainment**. This alternative does not assume the development of new 500-kV transmission lines.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Non-attainment**. This alternative does not assume the development of new 500-kV transmission lines.
1.6 Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	**Non-attainment**. This alternative would not facilitate the development of a pumped storage facility
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Partial Attainment**. Although this alternative would not accommodate the storage of off-peak energy, new in-basin wind and geothermal energy resources would be developed hereunder.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Non-attainment**. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Non-attainment**. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Non-attainment**. This alternative would not provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Non-attainment**. This alternative would not provide voltage support for wind integration.

Source: The Nevada Hydro Company

Table E. 10-6. "New In-Area All-Source Generation" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Non-attainment**. This alternative would not facilitate the development of a pumped storage facility.

Goals and Objectives	Ability to Attain Stated Goal or Objective
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	**Non-attainment**. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Partial Attainment**. Under this alternative, additional high-voltage transmission capacity would be created.
I.2. Provide at least 1,100 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.3. Provide at least 1,800 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Attainment**. Implementation of this alternative would likely necessitate the development of new 500-kV transmission lines.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Attainment**. New transmission facilities could provide options for future expansion.
1.6. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility	**Non-attainment**. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Non-attainment**. This alternative would not accommodate the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Non-attainment**. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Non-attainment**. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Non-attainment**. This alternative would not provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Non-attainment**. This alternative would not provide voltage support for wind integration.

Source: The Nevada Hydro Company

10.2.4 “Alternative Advanced Transmission Technologies” Alternative

Under Section 1223 of the EPA Act 2005, Congress provided guidance as to the types of “advanced transmission technologies” that FERC should encourage, including, among others, high-temperature lines (including superconducting cables); underground cables; advanced conductor technology (including advanced composite conductors, high temperature low-sag conductors, and fiber optic temperature sensing conductors); high-capacity ceramic electric wire, connectors, and insulators; optimized transmission line configurations (including multiple phased transmission lines); modular equipment; wireless power transmission; ultra-high voltage lines; high-voltage DC technology; flexible AC transmission systems; energy storage devices (including pumped hydro, compressed air, superconducting magnetic energy storage, flywheels and batteries); controllable load; distributed generation (including PV, fuel cells, and microturbines); enhanced power device monitoring; direct systems state sensors; fiber optic technologies; power electronics and related software (including real time monitoring and analytical software); mobile transformers and mobile substations; and other technologies FERC considers appropriate.[29]

On November 17, 2006, FERC stated that “Section 1223 of EPA Act 2005 declares pumped hydro an ‘advanced transmission technology’ that this Commission should encourage, as appropriate. The Proposed Project meets the requirements of this section.”[30] As a result of that ruling, The Proposed Project has been federally designated an “advanced transmission technology.”

Based on that federal designation, a possible alternative would thus be another substitute “advanced transmission technology,” other than pumped storage. However, acting on their own, none of the technologies listed above would allow for the attainment of the Proposed Project’s two stated goals, six “transmission component” objectives, “pumped storage component” objectives, or any subset thereof. Acting in combination with the overall Proposed Project, additional opportunities may exist to more fully integrate additional advanced transmission technologies (e.g., high-temperature lines and ultra-high voltage lines) into the design of the Proposed Project.

The Big Rock decision would be inapposite with respect to an “Alternative Advanced Transmission Technology” because it would allow for a comparative analysis of the “project as a whole.” This alternative should, therefore, not be viewed as a separate alternative to the Proposed Project but, in combination with it, a functional element thereof. Possible variations of an “Alternative Advanced Transmission Technologies” alternative are presented in Section 6.2.3.1 (“Non-Wires” Alternative) and Section 6.2.3.6 (“Alternative Electricity Storage Technologies” Alternative) herein.

10.2.5 “Alternative Hydropower Site” Alternative

Although Proposed Project is an exception, as illustrated in Figure E. 10-1. Southern California Renewable Energy Resources,[31] within the southern California area, additional renewable energy

[29]/ Public. Law No. 109-58, Section 1223, 119 Stat. 594, 953-54 (2005).

[30]/ Federal Energy Regulatory Commission, Order on Rate Request (Docket Nos. ER-06-278-000 et al.), issued November 17, 2006, p. 12.

[31]/ California Public Utilities Commission, Report to the Legislature – SB 1038/Public Utilities Code Section 383.6: Electric Transmission Plan for Renewable Resources in California, December 1, 2003, Map 5.

will be predominately developed from wind and geothermal sources and not from new hydropower facilities. In California, the California Environmental Protection Agency (CalEPA) notes "[a] finite water supply and lack of suitable dam sites that do not already have hydroelectric facilities severely limits the potential for expansion."[32] Similarly, the CEC notes "opportunities for construction of new hydroelectric plants and pumped storage projects are extremely limited in California."[33] This is particularly evident in southern California where only 20 MW of total installed hydroelectric capacity presently exists.[34] As indicated in the 1990 TEC investigative study: "Pumped storage units are used by various utilities to mitigate the effects of daily peaking problems. The southwest region of California, however, has few sites that can be utilized for pumped storage projects, either because of insufficient or varying water supplies or an unacceptable elevation between the upper and lower reservoirs."[35]

Early in the 20th Century, abundant hydrological resources were the main sources of electricity. Hydroelectric development continued in all decades throughout the century, peaking in the 1960's. Substantial hydroelectric pumped storage capacity was added from the late 1960's to the early 1980's. Most of the cost-effective, environmentally appropriate sites for hydropower projects have already been developed.[36] Opportunities for new hydropower dam and storage projects are extremely limited in California due to a lack of sites, lack of availability of unallocated water rights, environmental protection measures, and strong political opposition. New development requires an approximate 10-year timeframe in order to plan and understand the potential environmental effects and prepare appropriate environmental safeguards.[37] The lack of additional suitable sites inhibits the further application of this technology.[38]

Based on a Statewide resource assessment conducted by the DOE, a total of 3,390 MW of undeveloped hydropower potential exists in California. Of that, 51 percent is contained within the following three major river basins: American, Feather, and Stanislaus River basins. As illustrated in Figure E. 10-2. Megawatts of Undeveloped Hydropower Potential, the DOE has not identified any megawatts of undeveloped hydropower potential in the southern California coastal region.[39] Because of the limited potential for additional pumped storage and other hydropower facilities, with the exception of Proposed Project, it is unlikely that any substantial new regional hydropower capacity can be created in southern California.

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[32]/ California Environmental Protection Agency, California Response to the Federal Energy Regulatory Commission Staff Report on Hydroelectric Licensing Policies, Procedures, and Regulations – Comprehensive Review and Recommendations Pursuant to Section 603 of the Energy Act of 2000 – May 2001, October 2001, p. viii.

[33]/ California Energy Commission, Integrated Energy Policy Report, CEC-100-2-5-007CMF, November 2005, p. 141.

[34]/ California Energy Commission, California Hydro-Electricity Outlook for 2002, Staff Report, P 700-02-004F, April 2002, p. 5.

[35]/ Op. Cit., Report on Reconnaissance Level Investigation of Lake Elsinore Pumped Storage Project, June 1990, p. 1-2.

[36]/ California Energy Commission, California Hydropower System: Energy and Environment, Append D – 2003 Environmental Performance Report, 100-03-018, October 2003, p. D-6.

[37]/ Op. Cit., Comparative Study of Transmission Alternatives: Background Report, 700-04-006, p. 13.

[38]/ Price, Anthony, Thijssen, Gerald, and Symons, Phil, Electricity Storage, A Solution in Network Operations?, October 12, 2000.

[39]/ Conner, Alison M. and Francfort, James E., U.S. Hydropower Resource Assessment for California, Idaho National Engineering and Environmental Laboratory, U.S. Department of Energy, October 1998, pp. 2 and 5.

Based on the absence of viable alternative hydropower (inclusive of both run-of-the-river and pumped storage) sites, the Applicant has determined that no hydropower siting alternatives exist that match the combination of surface waters within Lake Elsinore and the proximity of that existing water body to the Elsinore Mountains. As a result, the Applicant has concluded that an "Alternative Hydropower Site" alternative is infeasible.

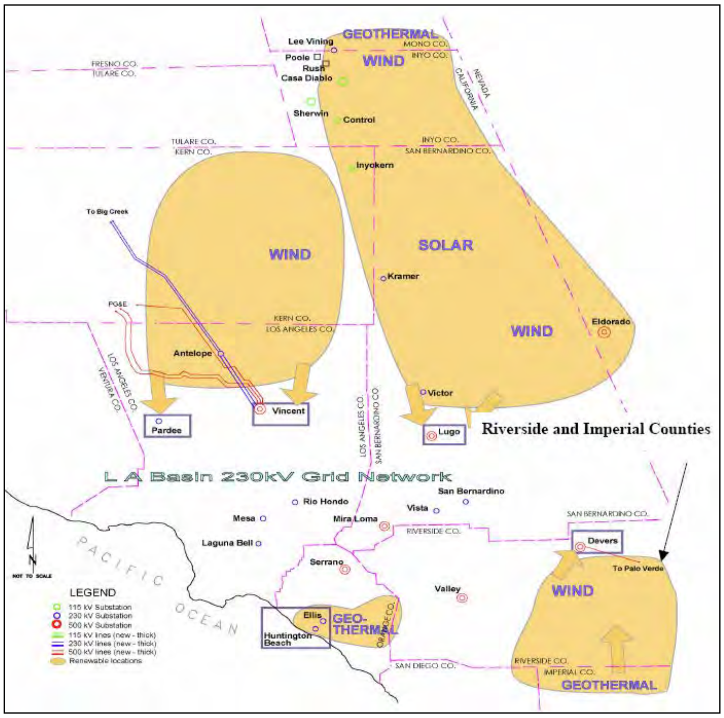

Figure E. 10-1. Southern California Renewable Energy Resources

Source: California Public Utilities Commission

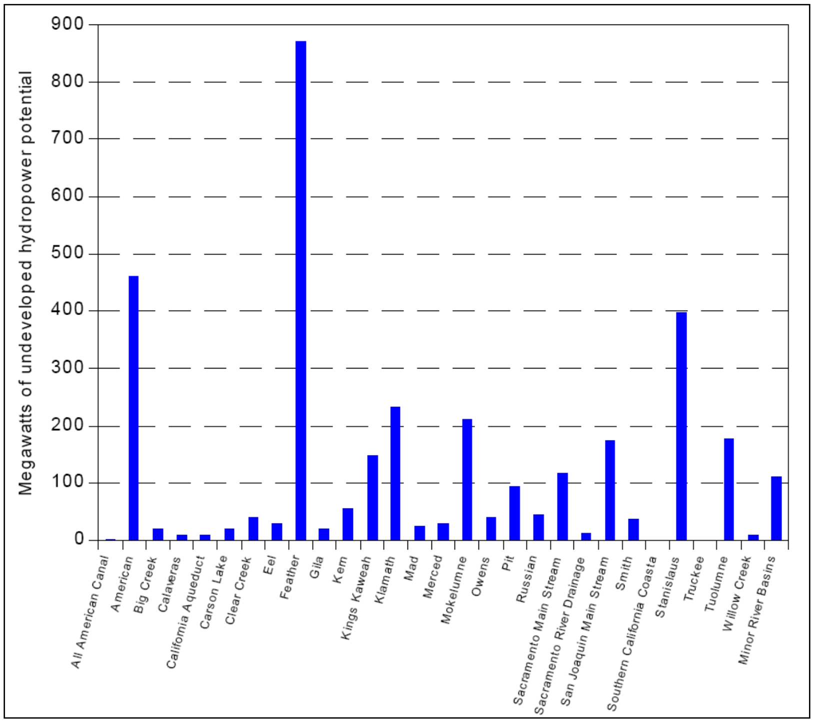

Figure E. 10-2. Megawatts of Undeveloped Hydropower Potential In the California River Basins

Source: United States Department of Energy

10.2.6 "Facility Siting" Alternative

The proposed pumped storage component of the project as identified and described in this amended application, constitutes the "staff alternative" as described in the FEIS. The FEIS identified and eliminated from further consideration, a number of alternative siting components including:

- **Alternative Powerhouse and Substation Site.** This alternative represents one of only two possible locations where the powerhouse could be feasibly constructed. As indicated in the Applicant's FLA and as described in the FEIS, three possible powerhouse sites were initially identified by the Applicant. The names used for the purpose of identifying these powerhouse sites (Ortega Oaks, Santa Rosa, and Evergreen) related to proximal streets or other local landmarks which define their location. The FEIS selected the Santa Rosa site and eliminated from consideration the other sites.
- **Alternative Upper Reservoir Site.** This alternative represents one of only two possible locations where the proposed upper reservoir could be feasibly constructed. As indicated in the Applicant's FLA and as described in the FEIS, two possible upper reservoir sites were initially identified by the Applicant. The names used for the purpose of identifying these sites (Decker Canyon and Morrell Canyon) related to USFS identification or other local landmarks which define their location. Morrell Canyon was identified by the Applicant as the preferred upper reservoir site in the FLA. The FEIS selected Decker Canyon and eliminated Morrell Canyon from further consideration.

10.2.7 "Electricity Storage Technologies" Alternative

The transmission grid is often considered analogous to a "highway" linking generation to load. Transmission networks serve as the "principal media for achieving reliable electric supply." Those networks provide flexibility so that the highway functions can be maintained over a wide range of generation, load, and transmission conditions, thus reducing the amount of installed generating capacity needed for reliability by connecting different electrical systems, permitting economic exchange of energy among systems, and connecting new generators to the grid.[40]

As indicated in the "National Transmission Grid Study," electricity is not a commodity that can be easily stored.[41] In drawing an analogy, the study states: "Imagine an interstate highway system without storage depots or warehouses, where traffic congestion would mean not just a loss of time in delivering a commodity, but a loss of the commodity itself."[42]

As indicated by the Electric Power Research Institute (EPRI): "Electricity is unique among energy commodities because of the difficulty of storing it in bulk. Instant-response storage units such as batteries, for example, have a very limited capacity, while pumped hydro storage is large but involves a long response time. Until large-scale storage of electricity becomes practical, electricity must be generated to closely follow the swings of demand in real time."[43]

Some power sources are intermittent and uncontrollable in that they do not provide continuous electrical power. This intermittent nature is characteristic of certain renewable energy technologies (e.g., solar and wind power) which require backup sources of power and/or storage devices to store power for later use.[44] As indicated by the President's Committee of Advisors on Science and Technology Panel on Energy Research and Development: "The extent to which intermittent renewable energy technologies (iRETs), wind and solar, can penetrate utility grids without storage depends on what other generating capacity is on the system. An electric system optimized to accommodate iRETs would have less baseload and more load-following or peaking capacity. However, if iRETs are to make very large contributions to electricity supplies in the longer term, technologies are needed that would make it possible to store energy for many hours at attractive costs. Storage will take on added importance in the future to ensure reliable, high-quality service. It will provide for increased renewable use and system stabilization with distributed generation. Areas of importance include pumped hydro, compressed air, battery,

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[40]/ Hirst, Eric and Kirby, Brendan, Transmission Planning for a Restructuring U.S. Electricity Industry, Edison Electric Institute, June 2001, p. 1.

[41]/ "Since electricity is not economically storable in large quantities, it must be generated when demanded and is consumed nearly instantaneously. Consumers or others acting on their behalf, cannot simply put a large amount of power in storage when the price is low for use later or resell it when the price is higher. If storage were available, it could be used to moderate the price and dampen any supplier market power. Also, because of transmission constraints and other physical limits on sending power over long geographic distances, power may not be available to send to higher prices areas to moderate the price" (Rose, Kenneth, 2005 Performance Review of Electric Power Markets – Update and Perspective, Virginia State Corporation Commission August 23, 2005).

[42]/ United States Department of Energy, National Transmission Grid Study, May 2002, p. ii.

[43]/ Electric Power Research Institute, The Western States Power Crisis: Imperatives and Opportunities, An EPRI White Paper, June 24, 2001, pp. 18 and 45.

[44]/ International Atomic Energy Agency, Health and Environmental Impacts of Electricity Generation Systems: Procedures for Comparative Assessment, Technical Report Series No. 394, 1999, p. 47.

inertial, and SMES [superconducting magnetic energy storage] technologies covering a wide capacity range."[45]

As indicated by the United States Government Accountability Office (GAO), "wind and solar energy are intermittent energy sources because wind speed and sunlight vary, depending, for example, on the time of day and the weather – on average, wind turbines operate the equivalent of less than 40 percent of the hours in a year due to the intermittency of wind. Alternatively, the electricity generated must be immediately used or transmitted to the power transmission grid because no cost-effective means exists for storing electricity."[46]

The traditional function of energy storage devices is to save production costs by holding cheaply generated off-peak energy that can then be dispatched during peak-consumption periods. Stored energy produced by base generation units during off-peak periods can avoid the need to use highly polluting supplemental/peak generation units during periods of peak demand. In addition, energy storage devices can be used to provide effective power system control. Different dispatch modes can be superimposed on the daily cycle of energy storage and additional capacity can be reserved for the express purpose of providing these control functions. As a distributed resource, energy storage devices can enhance power quality and reliability.[47]

When used in combination with renewable resources, storage devices can make supply coincident with periods of peak consumer demand and can facilitate large-scale integration of intermittent renewable resources onto the electric grid.[48] Figure E. 10-3. Wind Generation and System Load Have Different Daily Patterns presents a curve that plots energy demand and wind turbine generation on an hourly basis in California.[49] As noted, wind turbine generation is not coincident with demand.[50]

To optimize the use of wind energy and facilitate the balancing of generation and load, storage devices would permit off-peak and non-firm wind turbine energy to be stored and provided to consumers as firm and on-peak energy. As indicated by the American Solar Energy Society, "even greater wind and solar contributions might be possible through greater use of storage and high-efficiency transmission lines."[51]

45/ President's Committee of Advisors on Science and Technology Panel on Energy Research and Development, Report to the President on Federal Energy Research and Development for the Challenges of the Twenty-First Century, November 1997, pp. 6-3, 6-4, and 6-25.

46/ United States Government Accountability Office, Department of Energy – Key Challenges Remain for Developing and Deploying Advanced Energy Technologies to Meet Future Needs, GAO-07-106, December 2006, p. 31.

47/ California Energy Commission, California's Electricity System in the Future – Scenario Analysis in Support of Public-Interest Transmission System R& D Planning, P500-03-010F, Public Interest Energy Research Program Energy Systems Integration Team, April 2003, p. 41.

48/ University of Missouri-Rolla, Energy Storage, Overview of Energy Storage Technologies, undated, p. A-1 (http://www.ece.umr.edu/links/power/Energy_Course/energy/Renewables/DOE_Charac/append_overview.pdf).

49/ Hawkins, David, Wind Generation and Grid Operations: Experience and Perspective, California Independent System Operator, March 23, 2005.

50/ On the day of the State's peak demand (August 24, 2006), wind power produced at 254.6 MW at the time of peak demand, representing only 10.2 percent of wind's rated capacity of 2,500 MW. Over the preceding seven days (August 17-23, 2006), wind produced at 89.4 to 113.0 MW, averaging only 99.1 MW at the time of peak demand or just 4 percent of rated capacity (Source: Dixon, David, Wind Generation's Performance during the July 2006 California Heat Storm, Energy Central Network, August 8, 2006).

51/ American Solar Energy Society, Tackling Climate Change in the U.S., - Potential Carbon Emission Reductions from Energy Efficiency and Renewable Energy by 2030, January 2007, p. 4.

Alternating current (AC) electricity is not directly stored but is converted and stored by mechanical, chemical, or electrical potential energy methods. Each of these methods has its own particular operational range and capabilities. Electricity storage technologies include pumped hydroelectric storage, compressed air energy storage (CAES), …various types of batteries, flywheels, electro-chemical capacitors, superconducting magnetic energy storage, and thermal storage.[52] With 38 operating plants, pumped storage is the "most popular large storage technology in the world with 19 gigawatts in the United States (2.5 percent of total generation).[53]

Lithium-ion batteries and green hydrogen production are also being used for energy storage on a utility scale basis in some circumstances. Also, other gravity or geologic storage technologies are being developed, but none has been proven on the scale of the proposed Project.

As reported by the American Physics Society (APS): "Storage technologies are at various states of commercial maturity, which can be broken down into four stages: [1] Commercial: At least 5 units installed, with more than 10 years of experience per plant, with demonstrable economic return on investment; [2] Pre-commercial: One or more plants installed as commercial ventures, but lacking either demonstrable benefit or sufficient cumulative time in service to be regard as commercial; [3] Demonstration: Some in-grid, in-field experience, but not commercial or pre-commercial as defined above; [4] Developmental: Laboratory units, sub-scale plants, or technologies used in non-utility applications."[54]

Only a few of the mentioned technologies, except for pumped hydropower and flywheels, are at a point where they can make significant contributions in transmission and distribution of electricity.[55]

Of those electricity storage devices, those categorized as "pre-commercial prototypes," "demonstration stage," and/or "developmental" by the APS were rejected by the Applicant because effectuation is deemed to be infeasible since the technologies for those alternatives are not presently available. As such, an "Alternative Electricity Storage Technologies**"** alternative could not be reasonably effectuated by the Applicant.

Battery systems that have shown promise for utility application are lithium-ion and vanadium redox flow batteries. Lithium-ion and VRBs have been used in a number of smaller-scale utility-scale applications. VRBs and lithium-ion batteries remain a developing large-scale technology undergoing limited and, as yet, incomplete demonstration. The technical performance of vanadium redox and lithium-ion battery systems built to date has apparently shown their usefulness and reliability in a number of utility applications, including peak shaving, wind farm stabilization and leveling, and backup power. While the specifications for batteries will depend on the application and location, batteries generally are most useful to utilities when they have reasonably high-power ratings for relatively long duration (8 hours or longer).

[52]/ Baxter, Richard, Energy Storage - A Nontechnical Guide, 2006, pp. 55-164.

[53]/ United States Department of Energy (Energetics, Incorporated), Technology Briefs – Overview of Advanced Electric Delivery Technologies, Office of Electric Transmission and Distribution, August 2004, p. 40.

[54]/ American Physics Society, APS Panel on Public Affairs, Challenges of Electricity Storage Technologies – A Report from the APS Panel on Public Affairs Committee on Energy and Environment, May 2007, pp. 9-10.

[55]/ Ibid., p. 10.

Presently, lithium-ion and vanadium redox flow batteries are technologically and economically infeasible on a scale sufficient to provide energy storage capacity comparable to that of the Proposed Project. For example, the largest lithium-ion battery installation in California "Moss Landing Battery Storage Project", has 400MW of capacity with 1,600 MWh total storage (4 hour duration at full capacity), much less than the Proposed Project at 500MW and 6000 MWh of storage (10 hours of duration at full capacity). Moss Landing has also had many operational and reliability issues that have left it out of service for long periods of time.

Besides pumped storage, only flywheel technology currently has the potential for commercial application. Flywheels store energy in a spinning disk on a metal shaft. Increases in the speed of rotation, the mass of the disk, and locating more of the mass closer to the rim of the disk will increase the amount of energy stored. This technology is best utilized for applications requiring short discharge time (e.g., stabilizing voltage and frequency). A flywheel farm approach, where several devices are networked together, may be adaptable to large-scale energy management. Flywheels necessary for wider commercial energy storage applications are, however, primarily limited by materials properties and cost.[56]

Presently, flywheels are technologically and economically infeasible on a scale sufficient to provide energy storage capacity comparable to that of the Proposed Project. A potential "flywheel" alternative was rejected by the Applicant because effectuation is deemed to be infeasible since the technology for that alternative is not presently available. As such, a "flywheel" alternative could not be reasonably effectuated by the Applicant.

Lack of storage is a major impediment to the introduction of renewable energy from intermittent sources.[57] Electric-drive vehicles have the potential to make major contributions to the electric supply system, as storage or generation resources, or both.[58] Under a vehicle-to-grid power (V2G) or vehicle-based distributed generation application, electric-drive vehicles (i.e., battery, fuel cell, and hybrid) can be used to provide power for specific electric markets. It has been reported that "when just one-fourth of the U.S. light vehicle fleet has converted to electric drive, it would rival the electricity generation power capacity of the entire utility system."[59] It has been further reported that the "most important role for V2G may ultimately be in emerging power markets to support renewable energy. The two largest renewable sources likely to be widely used soon, photovoltaic and wind turbines, are both intermittent. At low levels of penetration, the intermittency of renewable energy can be handled by existing mechanisms for managing load and supply fluctuations. However, as renewable energy exceeds 30% of the power supply, additional resources are needed to match the fluctuating supply to the already fluctuating load. Intermittency can be managed either by backup or storage. 'Backup' refers to generators that

[56]/ American Physics Society, APS Panel on Public Affairs, Challenges of Electricity Storage Technologies – A Report from the APS Panel on Public Affairs Committee on Energy and Environment, May 2007, p. 4)

[57]/ Kempton, Willett, Tomić Jasna, Letendre, Steven, Brooks, Alec, and Lipman, Timothy, Vehicle-to-Grid Power: Battery, Hybrid, and Fuel Cell Vehicles as Resources for Distributed Electric Power in California, California Air Resources Board and California Environmental Protection Agency, June 2001, p. 1.

[58]/ Kempton, Willett and Letendre, Steven E, Electric Vehicles as a New Power Source for Electric Utilities, Transportation Research 2(3), 1997, pp. 157-175.

[59]/ Kempton, Willett and Tomić, Vehicle-to-Grid Power Implementation: From Stabilizing the Grid to Supporting Large-Scale Renewable Energy, Journel Power Sources Volume 144, Issue 1, 1 June 2005, Pages 280-294.

can be turned on to provide power when the renewable source is insufficient. 'Storage' has the advantage of additionally being able to absorb excess power but adds the constraint that giving back power is duration-limited (as is absorbing it). In terms of V2G, backup can be provided by the fueled vehicles (fuel cell and hybrid running motor-generator). Storage can be provided by the battery vehicle and the plug-in hybrid running V2G from its battery."[60]

Although V2G power is not yet in commercial application, electric-drive vehicles (EDVs) can serve as an alternative storage technology for off-peak power. As indicated by CEC, "plug in hybrid vehicles (PHEVs) may offer an opportunity to obtain the distribution system benefits of local energy storage without having to purchase the equipment solely for that purpose. . .When plugged in to the grid, PHEVs or other electric vehicles with sufficient energy storage capacities could be used as a source of backup power to a home during an outage. Alternatively, they could be used to supply power to the grid in times of peak loads at either the system or distribution level. These types of applications (referred to as 'Vehicle to Grid' or V2G), would be auxiliary benefits of the customer purchasing the vehicle for transportation."[61]

A potential "PHEV/EDV/V2G" alternative was rejected because effectuation is deemed to be infeasible by the Applicant since the technologies and distribution systems for that alternative is not presently available. If available, implementation would be subject to the actions of other parties and the Applicant has no reasonable ability to or expectations for the imposition of control or influence over the actions of those parties. As such, this alternative could not be reasonably effectuated by the Applicant.

Table E. 10-7. Summary of the Development Status of Key Electricity Storage Devices

Commercial	Pre-Commercial Prototype	Demonstration Stage	Developmental
Pumped Hydro	CAES	Zinc-Bromine Battery	Lithium-Ion Battery forgrid application
Flywheel for power quality applications at the consumer site	Lead-Acid Battery[1]	Flywheel (as grid device)	SMES (as grid device)
	Ni-Cad Battery[1]	Vanadium Redox Battery[2]	Electro-chemical capacitors
	Flywheel (as load device)	Electro-chemical capacitor	Other advanced batteries

Notes:

1. Commercial in utility emergency backup power applications.
2. Commercial in telecom applications < 15 kW.

Source: American Physics Society

60/ Ibid.

61/ California Energy Commission (Energy and Environmental Economics, Inc.), PEIR Final Project Report - Value of Distribution Automation Applications, CEC 500-2007-028, p. 96.

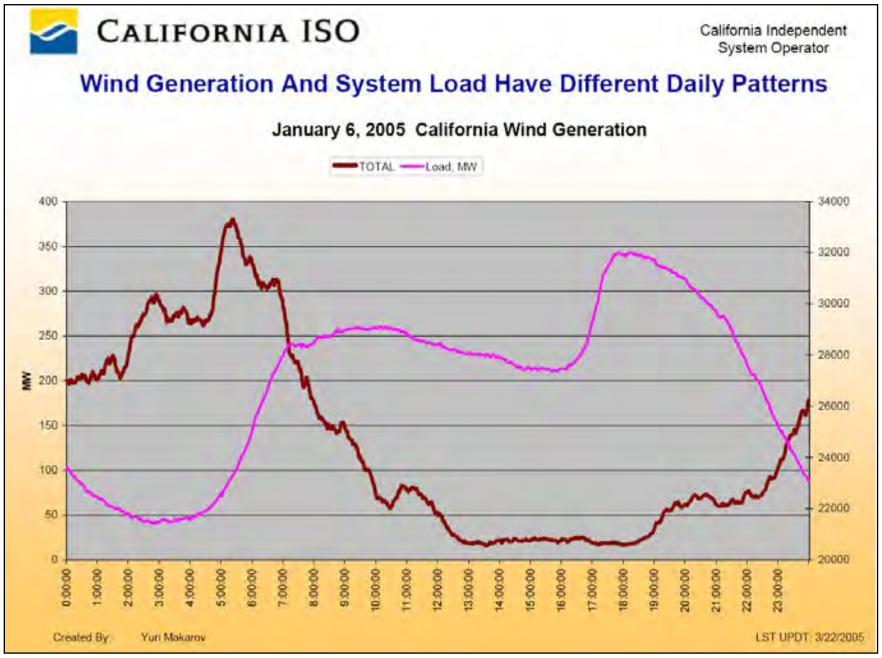

Figure E. 10-3. Wind Generation and System Load Have Different Daily Patterns
Source: California Independent System Operator

10.2.8 "Hydropower Facility" Alternative

The Applicant has considered the following additional hydroelectric facility alternatives.

10.2.8.1 "Small-Hydropower" Alternative

"Small hydro" (<30 MW) is considered a renewable energy resource. FERC treats, as a single generating facility, the aggregated generation at a site for which an interconnection customer seeks a single point of interconnection. As such, if the total aggregated generation exceeds 20 MW, the combined project would not qualify as small-generator status. The Applicant would need to undertake multiple small-hydro projects to approach the generation capacity associated with the "Applicant's Proposed Project." Multiple small-generator projects would likely increase the impacts associated with a single, larger project.

A small hydro project was considered and rejected as infeasible because there are not sufficient water resources in southern California to allow for the development of multiple small-scale hydropower projects. If opportunities could be located, multiple small-generator projects would not substantively reduce or result in the avoidance of the Proposed Project's environmental effects.

10.2.8.2 "Relicense, Retrofit, Upgrade Existing Hydroelectric Facilities" Alternative

Retrofit of and upgrades to existing hydropower projects, including increasing the efficiency of turbines and generators and increasing the flow or head, could increase the capacity of those facilities. However, based on an analysis conducted by the Oak Ridge National Laboratory for the DOE, no existing hydropower facilities located in the southern California area were identified which were "likely to benefit from upgrades." Projects deemed to be "likely to benefit from upgrades" included those that were constructed prior to 1940 and those that were constructed between 1940 and 1970.[62]

Only about five percent of the 67,000 existing dams in the United States have potential hydropower capacity and many of these dams are unsuitable for hydropower development because of size, isolation, and/or safety consideration. The Applicant has not identify any existing hydropower projects, located in the southern California area, that would be apparent candidates for potential relicensing, retrofitting, and/or upgrading that were not presently proposed for or presently undergoing relicensing. Even if one or more projects could be identified, substantive contractual constraints would exist which would need to be resolved allowing for the Applicant's joint participation. Because participatory contractual agreements with existing facility operators would logically be contrary to the economic interests of those operators, the Applicant concluded that this alternative was both speculative and infeasible.

10.2.9 "Alternative Generation" Alternative

The electric generating system must have sufficient operating generating capacity to supply the peak demand for electricity by consumers. An additional amount of reserve power plant capacity must be operational to act as instantaneous backup supplies should some power plants or transmission lines unexpectedly fail. According to the Western Systems Coordinating Council (WSCC), to reliably deliver power, control area operators should maintain operating reserves of seven percent of their peak demand. If operating reserves decline below that level, customers that have agreed to be interrupted in exchange for reduced rates may be disconnected. If operating reserves get as low as one and a half percent, firm load will likely be shed locally, resulting in rotating blackouts to avoid system-wide blackouts.

As opposed to baseload power plants that operate continuously, peaking power plants (peakers) generally only run when demand is high. Although natural gas turbine plants dominate the peaker plant category, other plant types, including pumped storage facilities, also are used to provide power on a peak-demand basis.

As indicated in the FEIS, FERC identified "a natural gas-fired simple cycle combustion turbine as the likely alternative to the LEAPS project because the LEAPS project would operate at a 35.6 percent plant factor and would be dispatched in a somewhat similar manner to meet peak demand."[63] Substantial documentation exists demonstrating that thermal power plants generate significant environmental impacts, including criteria pollutants and GHG emissions, and are difficult to site in southern California based on the non-attainment status of the South Coast Air Basin.

As indicated in Table E. 10-8. "Alternative Generation" Alternative - Ability to Attain Stated Goals and Objectives, a natural gas-fired simple cycle combustion turbine, constructed in combination with a primary transmission interconnection, does not appear to allow for the attainment of the

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[62]/ Railsback, S.F., et al., Environmental Impacts of Increased Hydroelectric Development of Existing Dams, Publication No. 3585, United States Department of Energy, Oak Ridge National Laboratory, April 1991, pp. 2-3.

[63]/ Op. Cit., Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, FERC/EIS-0191F, p. 2-2.

Project's two stated goals and does not appear to allow for the attainment of any of the five "pumped storage component" objectives.

Although an "Alternative Generation" alternative would potentially allow for the partial attainment of the stated objectives, because the "Applicant's Proposed Project" includes the full Proposed Project, CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action." As a result, an "Alternative Generation" alternative was rejected by the Applicant because that alternative does not consider the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors).

Table E. 10-8. "Alternative Generation" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Non attainment**. This alternative does not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	**Non attainment**. This alternative does not facilitate the development of a pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Attainment**. Under this alternative, additional high-voltage transmission capacity would be created.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Attainment**. Under this alternative, new 500-kV transmission lines would interconnect SDG&E and SCE systems.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Attainment**. This alternative would implement this objective.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Attainment**. Additional distribution and transmission improvements could serve to fortify localized systems and enhance reliability.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	**Non-attainment**. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	

Goals and Objectives	Ability to Attain Stated Goal or Objective
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Non-attainment**. This alternative would not accommodate the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Non-attainment**. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Non attainment**. This alternative would not provide additional regulation, fast responding spin, or load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Non-attainment**. This alternative would not provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Non-attainment**. This alternative would not provide voltage support for wind integration.

Source: The Nevada Hydro Company

10.2.10 "Design and Development Variation" Alternative

The results of detailed design and engineering studies are presented in this application. In addition to the alternative upper reservoir, powerhouse, transmission alignment, and substation alternatives identified therein, numerous design and development variations were identified for the Project's individual component parts. Those options included, but where not limited to: (1) dam and dike design alternatives (e.g., zoned earth-fill dam with a central impervious core or inclined upstream impervious zone, concrete-faced earth-fill dam, earth-fill dam with an asphaltic-concrete upstream face, and gravity dam constructed of roller compacted concrete), including variations in dam and dike configuration; (2) alternative reservoir liner systems (e.g., clay, asphaltic concrete, geo-membrane, and combination liner systems); (3) alternative penstock alignments and configurations; and (4) transmission alignment alternatives.

With regards to the upper reservoir site, based on topographic considerations and the proximity of the San Mateo Canyon Wilderness, only two candidate reservoir sites were identified in the Elsinore Mountains (Decker Canyon and Morrell Canyon). Based on environmental consideration, the Decker Canyon Reservoir site was identified by FERC and by the USDA Forest Service as the preferred location for that facility. As such, based on requisite FERC-licensing and USDA Forest Service permitting requirements and stipulations, the Applicant has eliminated the alternative Morrell Canyon Reservoir site from further consideration, concluding that any alternative upper reservoir site would be speculative since, based on the findings of the FEIS, the entitlement of an alternative forebay within the TRD would appear unlikely.

In formulating a reasonable range of alternatives, except as otherwise described herein, the Applicant has not elected to examine other alternatives involving only relatively minor design variations to the Project's individual components.

10.3 Alternatives Under Consideration

With the exception of the "No Project/No Build" alternative, and where not otherwise noted, each of the following development (build) alternatives satisfies, in whole or in part, the stated goals and objectives of the "Applicant's Proposed Project."

10.3.1 Alternative 1 – Alternate Interconnection Location

SCE has progressed development for improvements to the existing 115-kV distribution system in a portion of western Riverside County, with the development of a new 500/115-kV substation on an approximately 40-acre site in the Alberhill area of unincorporated Riverside County, the "Alberhill Substation". The Applicant is proposing to construct a substation adjacent to the proposed Alberhill Substation, "Bluewater Substation" to step-up line voltage from 230 kV to 500 kV to allow interconnection with the Bluewater Renewable Energy Storage Project and the Alberhill Substation and the Valley-Serrano 500 kV transmission line.

In the event the Alberhill Substation does not proceed, the Applicant may need to construct a new facility, the "Lake Substation", at the previously proposed Lake location, approximately 2 miles Northwest of the Alberhill Substation.

The following analysis compares the potential social and environmental effects of this alternative against the potential impacts associated with the "Applicant's Proposed Project." Only those topical areas where environmental impacts may differ from those associated with the "Applicant's Proposed Project" are discussed below.

- **Aesthetics**. Although both sites would be visible from the I-15 Freeway, the alternative Lake Substation is located directly adjacent to the freeway (providing a foreground view from passing motorists) while the proposed substation site at Alberhill is located further from that arterial (providing a middle-ground view from passing motorists).

Since the freeway is located at a higher elevation than either substation site, visual screening would have limited effectiveness. The I-15 Freeway is not a designated scenic highway in the general area and numerous industrial uses presently exist in close proximity thereto. Although the proposed and alternative substations will result in a physical change to both sites, independent of the site selected, the aesthetic impacts would not be deemed significant.

- **Agricultural Resources**. Since the proposed and the alternative substation sites are not presently used for any agricultural use, the impacts on agricultural resources would be generally comparable. The proposed substation site is, however, presently used as a horse ranch and may allow for both boarding of horses by non-residents and include a breeding program and veterinary activities. The extent of any commercial operations at that facility are unknown but appear limited based on available visual observations.

- **Air Quality**. During construction, the quantity of construction criteria pollutants and GHG emissions would not be expected to differ substantially between the two substation sites.

Sulfur hexafluoride (SF_6), a non-toxic and non-flammable gas, is used for the insulation of GIS technology. The EPA has identified sulfur hexafluoride as a GHG with a global warming potential 23,900 times the effect of an equal mass of carbon dioxide (CO_2) and an atmospheric lifetime of 3,200 years. Because the use and operation of sulfur hexafluoride, including leak detection and effective management practices, will be in accordance with applicable the EPA standards,[64] potential air quality impacts would be comparable.

- **Biological Resources**. The alternative Lake Substation is located in an undeveloped and mostly disturbed area between Temescal Road and the I-15 Freeway. The vegetation is dominated by coastal sage scrub and areas of disturbed soil. Existing land uses consist of vacant lands and an active storage facility for construction equipment. The coastal sage scrub habitat on the site is considered low-quality and is frequently disturbed by human activity, such as trash dumping, vehicle usage, and pedestrian traffic. Based on the findings of the 2008 focused surveys, there are no sensitive plant or wildlife species present within the area of the Lake Switchyard.

Portions of the Alberhill site and its associated 500-kV connection to the existing Valley-Serrano 500-kV transmission line may be in the process of being incorporated into the Western Riverside County Regional Conservation Authority. Based on "Riverside County Multiple Species Habitat Conservation Plan" (MSHCP) report generator, the proposed Alberhill site requires a burrowing owl habitat assessment. Based on the current habitat on the site, the coastal sage scrub cover provides low quality burrowing owl habitat. The human disturbance also contributes to the degraded habitat quality and, therefore, the proposed site does not appear to warrant burrowing owl surveys since site conditions are not conducive to the presence of that species.

As indicate in the MSHCP, but not verified through on-site biological surveys, this proposed substation site also contains the following: (1) "Criteria Area Species" (thread-leaved brodiaea, Davidson's saltscale, Parish's brittlescale, smooth tarplant, round-leaved filaree, Coulter's goldfields, little Mousetail); (2) "Narrow Endemic Plant Species" (Munz's onion, San Diego ambrosia, slender-horned spineflower, many-stemmed dudleya, spreading navarretia, California Orcutt grass, San Miguel savory, Hammitt's clay-cress, Wright's trichocoronis).

The general area contains suitable habitat for several ground-nesting birds. A nesting bird survey will, therefore, be required should construction activities occur on the proposed substation site during the nesting period.

There are areas within the immediate vicinity of the proposed and alternative substation sites that contain jurisdictional drainage features. Careful substation siting would allow for the facility's development, on either site, avoiding or minimizing encroachment into a designated 100-year flood plain and/or directly impacting jurisdictional drainage features. These features may still be indirectly affected by associated construction activities and will need to be evaluated once final design plans have been formulated.

- **Cultural Resources**. No cultural resources have been identified or are suspected to occur on the proposed substation site.
- **Geology and Soils**. Neither of the two substation sites are located in close proximity to an Alquist-Priolo Earthquake Fault Zone. Since the "Class B" Elsinore Fault is located to the south of the proposed and alternative substations, based on comparable distance from that fault, the two sites would have a generally comparable impact upon geology and soils.
- **Hazards and Hazardous Materials**. Neither the proposed nor the alternative substations will result in a significant hazard to the public or to the environment through reasonably foreseeable upset or accident conditions involving the release of hazardous materials to the environment. Development will not impair the implementation of or physically interfere with an adopted emergency response plan or an emergency evacuation plan. The construction and operation of either substation site will

[64]/ United States Environmental Protection Agency, Substation Maintenance – Electrical Operating Procedures, EOP 430.51.4, March 28, 2005.

not result in the release or hazardous materials within one-quarter mile of an existing or proposed school site. Neither substation site is believed to be located on a property included on a list of hazardous material sites.

- **Hydrology and Water Quality**. The proposed and alternative substation sites are located within the jurisdiction of the Regional Water Quality Control Board, Santa Ana Region (SARWQCB); however, because the “Applicant’s Proposed Project” is multi-jurisdiction, water quality permitting is subject to the jurisdiction of the State Regional Water Quality Control Board (SWRCB).

Waters discharging from the proposed Alberhill site would first drain to Temescal Creek, above Lee (Corona) Lake, a tributary of the Santa Ana River (HU No. 801.00). Lee (Corona) Lake is an agricultural impoundment and is a potable water source. All surface water discharges would be in accordance with SARWQCB and SWRCB permit requirements.

Waters discharging from the alternative Lake Substation would continue to discharge to Temescal Creek but below Lee (Corona) Lake. Hydrologic and water quality impacts from the two switchyards would be generally comparable.

- **Land Use and Planning**. Both substation sites are designated “Light Industrial” in the “Elsinore Area Plan,” a component of the “County of Riverside General Plan.” As indicated therein: “The Light Industrial land use designation allows for a wide variety of industrial and related uses, including assembly and light manufacturing, repair and other service facilities, warehousing, distribution centers, and supporting retail uses. Building intensity ranges from 0.25 to 0.6 FAR [floor area ratio].” An electrical substation would appear to be consistent with the land-use policies of the “Riverside County General Plan.”

In accordance with Article XI (M-SC Zone) of the Riverside County Zoning Ordinance (Ordinance No. 348), both substation sites are zone “M-SC Zone (Manufacturing – Service Commercial).” As specified therein: “It is the intent of the Board of Supervisors in amending this article to: (1) promote and attract industrial and manufacturing activities which will provide jobs to local residents and strengthens the County’s economic base; (2) provide the necessary improvements to support industrial growth; (3) insure that new industry is compatible with uses on adjacent lands; and (4) protect industrial areas from encroachment by incompatible uses that may jeopardize industry.” Permitted uses include “electrical and electronic apparatus and components.” An electrical substation would appear to be consistent with the “Riverside County Zoning Ordinance.”

- **Mineral Resources**. Neither site contains recoverable mineral resources.
- **Noise**. The construction and operation of the Applicant-proposed and the alternative Lake Substation sites would have a generally comparable noise impacts. With the exception of corona and periodic maintenance activities, noise impacts would generally be limited to the construction term.
- **Population and Housing**. The proposed and the alternative substation sites would have a generally comparable impact upon population and housing.
- **Public Services**. The substation sites are located in close proximity to Riverside County Fire Station No. 64 (Sycamore Creek) (25310 Campbell Ranch Road, Corona 92883), operated by the Riverside County Fire Department. The Applicant-proposed and the alternative Lake Substation sites would have a generally comparable impact upon police, fire protection, and vector control services.
- **Recreation**. Neither the proposed nor the alternative substation site is presented used for public recreational purposes. As a result, site development will not impact recreational opportunities in the general area.

Lee (Corona) Lake is however, commercially operated as a fishing lake. Overhead transmission lines connecting the alternative Lake Substation to the existing Valley-Serrano 500-kV transmission line may encroach into the air space located above that water body. If so located, restrictions on overhead casting may need to be implemented to avoid contact with the high-voltage transmission lines. No such impacts would occur should the proposed Alberhill site be selected.

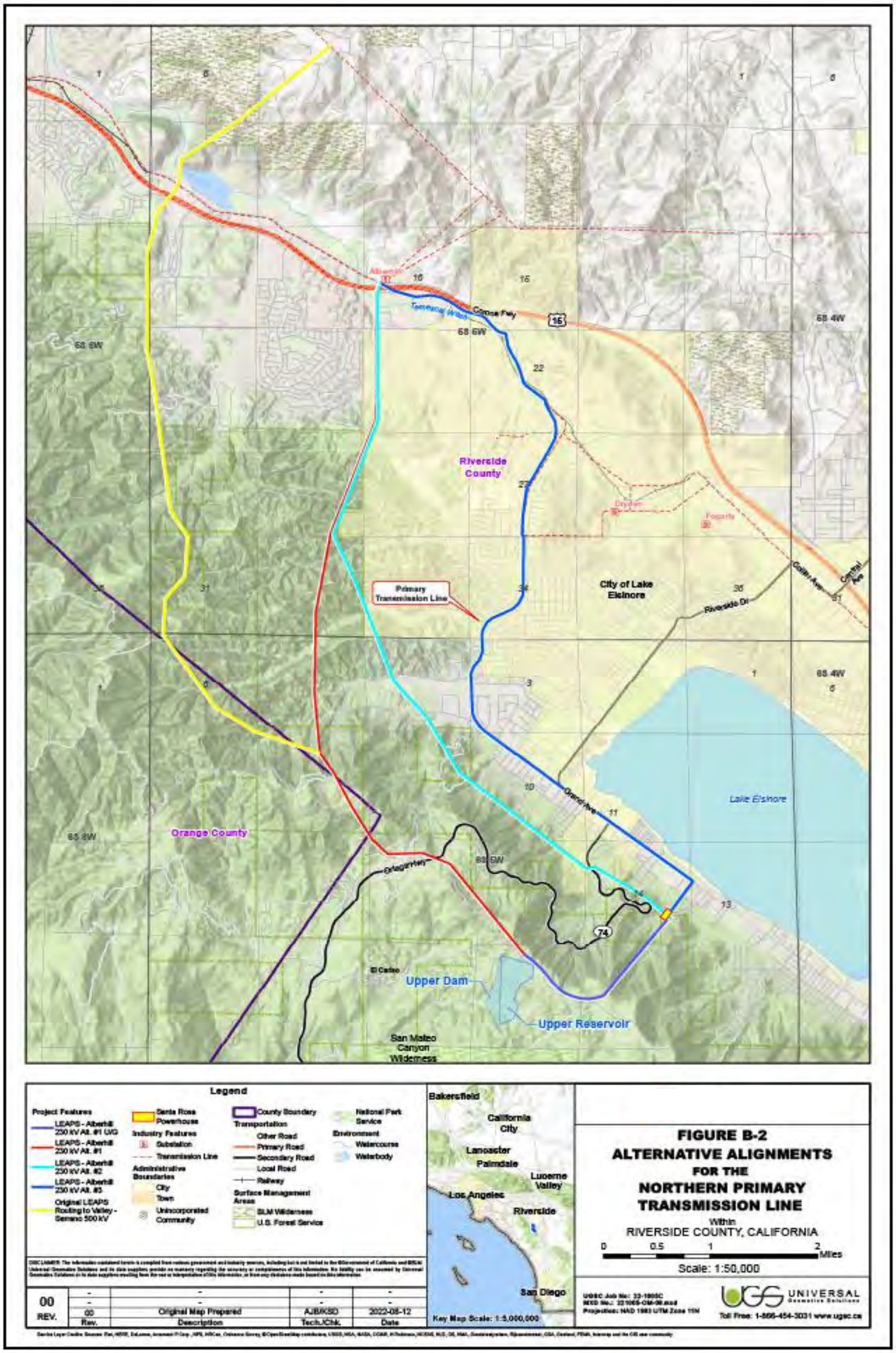
- **Transportation and Traffic**. Both the proposed and alternative substation sites are located along Temescal Canyon Road. As a result, construction-term and operational traffic would be expected to produce comparable traffic impacts along that roadway.
- **Utilities and Service Systems**. Development of the alternative substation site will likely necessitate the rerouting of an existing 36-inch diameter water line, relocation of existing overhead telephone lines, and the relocation of existing microwave repeater stations.

Energy Resources. Development of either substation site will beneficially contribute to the availability of energy resources both within the general area and throughout the southern California area.

10.3.2 Alternative 2 – Alternate Transmission Routing

Applicant is proposing an 8.5 mile primary transmission line or interconnection from the Santa Rosa Substation to the Bluewater Substation, which interconnects with the SCE proposed Alberhill Substation.

The Applicant considered a number of transmission alignments and interconnection locations in follow up on commitments made to the Forest Service in a meeting in December 2021. These alternatives included alignments with varying distances traversing Forest Service land including the originally proposed transmission alignment from the FEIS and three alternative alignments. The alternatives studied are illustrated in the following Figure - Alternative Alignments for Primary Transmission Line.


Primary Transmission Line
Riverside County
City of Lake Elsinore
Lake Elsinore
Orange County
Upper Dam
Upper Reservoir
San Mateo Canyon Wilderness
Legend
Project Features
LEAPS - Alberhill 230 kV Alt. #1 U/G
LEAPS - Alberhill 230 kV Alt. #1
LEAPS - Alberhill 230 kV Alt. #2
LEAPS - Alberhill 230 kV Alt. #3
Original LEAPS Routing to Valley - Serrano 500 kV
Santa Rosa Powerhouse
Industry Features
Substation
Transmission Line
Administrative Boundaries
City
Town
Unincorporated Community
County Boundary
Transportation
Other Road
Primary Road
Secondary Road
Local Road
Railway
Surface Management Areas
BLM Wilderness
U.S. Forest Service
National Park Service
Environment
Watercourse
Waterbody
Bakersfield
California City
Lancaster
Palmdale
Lucerne Valley
Los Angeles
Riverside
San Diego
Key Map Scale: 1:5,000,000
FIGURE B-2
ALTERNATIVE ALIGNMENTS
FOR THE
NORTHERN PRIMARY
TRANSMISSION LINE
Within
RIVERSIDE COUNTY, CALIFORNIA
Scale: 1:50,000
Miles
UNIVERSAL
Toll Free: 1-866-454-3031 www.ugsc.ca
00
REV.
Original Map Prepared
AJB/KSD
2022-08-12
Rev.
Description
Tech./Chk.
Date

The project is now proposing an alignment on the outskirts of the City of Lake Elsinore with 230 kV transmission line making undergrounding more practical (shown in dark blue).

To summarize the alternative route options:

- Route 1 – Proposed Project 8.5 mile 230 kV underground route to Alberhill (blue)
- Route 2 – Alternative 5.75 mile 230 kV above ground route to Alberhill (cyan) plus a 2-mile common underground section from Santa Rosa Powerstation to the upper reservoir location (green)
- Route 3 – Alternative 7.5 mile 230 kV above ground route to Alberhill (red) plus a 2-mile common underground section from Santa Rosa Powerstation to the upper reservoir location (green)
- Route 4 – Alternative 10-mile 230 kV above ground route to alternative Lake Substation (yellow) plus a 2-mile common underground section from Santa Rosa Powerstation to the upper reservoir location (green)

The following analysis compares the potential environmental effects of these alternatives against the potential impacts associated with the “Applicant’s Proposed Project.” Only those topical areas where environmental impacts may differ from those associated with the “Applicant’s Proposed Project” are discussed below.

- **Cultural Resources**. Given Route 1 is an urban route through already developed areas, we expect cultural resource impacts to be minimal. Routes 2, 3 and 4 all require disturbance through relatively undisturbed areas of the Cleveland National Forest lands, which would have a higher potential for encountering cultural resources.
- **Geology and Soils**. All routes are located in proximity to an Alquist-Priolo Earthquake Fault Zone and the Elsinore Fault, with no site having any greater or lesser risk.
- **Hazards and Hazardous Materials**. None of the proposed routes will result in a significant hazard to the public or to the environment through reasonably foreseeable upset or accident conditions involving the release of hazardous materials to the environment. However, development may impair the implementation of or physically interfere with an adopted emergency response plan in the event of fire or other emergency. Given Route 1 is both underground and located in urban areas, risk related to fire is minimal. Routes 2, 3 and 4 all increase risk related to forest fire response due to overhead powerlines and their location within the Cleveland National Forest. While these risks can be mitigated, they are still higher than the risk associated with Route 1.
- **Hydrology and Water Quality**. The proposed and alternative powerline routes are located within the jurisdiction of the Regional Water Quality Control Board, Santa Ana Region (SARWQCB); however, because the “Applicant’s Proposed Project” is multi-jurisdiction, water quality permitting is subject to the jurisdiction of the State Regional Water Quality Control Board (SWRCB).

  As outlined in Exhibit E Section 3, the proposed primary transmission line will cross one seasonal watercourse (Temescal Wash). Construction would be timed to construct this crossing during dry conditions or to isolate the construction from any instream flow that may be present during that time. Once installed the underground transmission line should have no lasting impact on hydrology or water quality. The above ground lines described in route alternatives 2, 3 and 4 can all be constructed with minimal impact on existing watercourses as towers would be sited away in areas that are higher in elevation and away from any watercourses, lakes, draws or washes. Since construction of alternatives 2, 3 and 4 would occur on steeper slopes within the Cleveland National Forest, there is the potential for construction activities to cause increased sediment delivery to watercourses during construction or prior to land reclamation. Since sediment control measures will be implemented as part of the required Storm Water Pollution Prevention Plan (SWPPP) and will result in the control of discharges to all existing surface waters, including Lake Elsinore and San Juan Creek, no impacts on native fish populations are anticipated.

- **Land Use and Planning**. Both substation sites are designated “Light Industrial” in the “Elsinore Area Plan,” a component of the “County of Riverside General Plan.” As indicated therein: “The Light Industrial land use designation allows for a wide variety of industrial and related uses, including assembly and light manufacturing, repair and other service facilities, warehousing, distribution centers, and supporting retail uses. Building intensity ranges from 0.25 to 0.6 FAR [floor area ratio].” An electrical substation would appear to be consistent with the land-use policies of the “Riverside County General Plan.”

In accordance with Article XI (M-SC Zone) of the Riverside County Zoning Ordinance (Ordinance No. 348), both substation sites are zone “M-SC Zone (Manufacturing – Service Commercial).” As specified therein: “It is the intent of the Board of Supervisors in amending this article to: (1) promote and attract industrial and manufacturing activities which will provide jobs to local residents and strengthens the County’s economic base; (2) provide the necessary improvements to support industrial growth; (3) insure that new industry is compatible with uses on adjacent lands; and (4) protect industrial areas from encroachment by incompatible uses that may jeopardize industry.” Permitted uses include “electrical and electronic apparatus and components.” An electrical substation would appear to be consistent with the “Riverside County Zoning Ordinance.”

- **Mineral Resources**. No routes impact mineral resources.
- **Noise**. The construction of Route 1 would have some impact on local residents given the route is urban and in proximity to local residences, however noise impacts would be limited to the duration of construction. Construction techniques and timing would mitigate impact. Given Routes 2, 3 and 4 are located within the Cleveland National Forest, noise impacts to local inhabitants would be of minimal impact, however would impact local wildlife species.
- **Population and Housing**. Given Route 1 is located in an urban route, there would be some impact to the local population during the duration of construction; since the primary transmission line is under ground, no long term impact is foreseen. Routes 2, 3 and 4 are generally located in non-urban areas however may have some impact to local residences in the routing near urban points of interconnection.
- **Public Services**. Development may impair the implementation of or physically interfere with an adopted emergency response plan in the event of fire. Given Route 1 is both underground and located in urban areas, risk related to fire is minimal. Routes 2, 3 and 4 all increase risk related to forest fire response due to overhead powerlines and their location within the Cleveland National Forest. While these risks can be mitigated, they are still higher than the risk associated with Route 1.
- **Recreation**. Route 1 has no significant impact to recreational activities given it is primarily urban and will use construction techniques that minimize impact to local populations. Routes 2, 3 and 4 may impact recreational users given the Cleveland National Forest location, mainly during the term of construction. Some additional impact may occur to recreational users as a result of overhead powerlines.

- **Transportation and Traffic**. Given Route 1 is an urban, underground construction within or near roadways, impact will occur to transportation and traffic. Impact will be mitigated by construction techniques and timing, and be limited to the duration of construction. Given Routes 2, 3 and 4 are located mainly within the Cleveland National Forest, they have minor impact, mainly near the urban locations at points of interconnection.
- **Utilities and Service Systems**. Given Route 1 is proposed to be underground, and within an urban setting, some impact to utilities and service systems is likely. Impacts will be mitigated in collaboration with local municipalities, and through construction techniques and timing. Impacts will also be only for the duration of construction. Routes 2, 3, and 4 are above ground, located mainly within the Forest, and as such will have minor impact.
- **Energy Resources**. Development of all routes will beneficially contribute to the availability of energy resources both within the general area and throughout the southern California region, no routes differ in their impacts to energy resources.

10.3.3 Alternative 3 – Alternate Interconnection to SDGE

Applicant is proposing a primary transmission line or interconnection from the Santa Rosa Powerstation to the Bluewater Substation, which interconnects with the SCE proposed Alberhill Substation.

As an alternative, the Applicant has considered a primary transmission line interconnection from the Santa Rosa Powerstation to the San Diego Gas and Electric (SDGE) system, approximately 20 miles South of the Santa Rosa Powerstation.For the purpose of the alternative analysis, the Applicant assumed a similar underground transmission line in an urban setting would be required.

The following analysis compares the potential environmental effects of these alternatives against the potential impacts associated with the "Applicant's Proposed Project." Only those topical areas where environmental impacts may differ from those associated with the "Applicant's Proposed Project" are discussed below.

- **Cultural Resources**. Both routes are in urban settings through already developed areas; we expect cultural resource impacts to be minimal however the alternative SDGE route is approximately 12 miles longer in length and as such would have greater likelihood for impact.
- **Geology and Soils**. Both routes are located in proximity to fault zones, with no site have any greater or lesser impact.
- **Hazards and Hazardous Materials**. Neither route has any greater impact.
- **Hydrology and Water Quality**. Neither route has any greater impact.
- **Land Use and Planning**. The SDGE route will have greater impact to urban lands given it is 12 miles greater in length.
- **Mineral Resources**. No routes impact mineral resources.
- **Noise**. The construction of the SDGE route would have greater impact on local residents given the route is generally more populated and also 12 miles greater in length.
- **Population and Housing**. The construction of the SDGE route would have greater impact on local residents given the route is generally more populated and also 12 miles greater in length.
- **Public Services**. Neither route has any greater impact.

- **Recreation**. Neither route has any greater impact.
- **Transportation and Traffic**. The construction of the SDGE route would have greater impact given the route is generally more populated and also 12 miles greater in length.
- **Utilities and Service Systems**. The construction of the SDGE route would have greater impact given the route is generally more populated and also 12 miles greater in length.
- **Energy Resources**. Development of both routes will beneficially contribute to the availability of energy resources both within the general area and throughout the southern California region.

10.3.4 Alternative 4 – Alternate Transmission Line Technologies[65]

Applicant is proposing an 8.5 mile primary transmission line or interconnection from the Santa Rosa Powerstation to the Bluewater Substation, which interconnects with the SCE proposed Alberhill Substation. Applicant is proposing a buried primary transmission line where practical.

The Applicant will work with the City of Lake Elsinore, the unincorporated Village of Summerland, Riverside County and the operators of existing underground utilities to determine the optimal installation approach for the primary transmission line. There may be areas where underground installation is not possible, not practical or results in unnecessary environmental, or social impact or impacts existing buried facilities. If such cases arise, the Applicant may need to undertake aboveground installation of the primary transmission line through a portion of the route.

There are multiple underground installation methods available. The method used depends upon a range of factors including land use, and each will have different environmental factors. The main installation methods include direct cable burial, ducted, and surface troughs. Given the nature of development along the proposed transmission route, the ducted cable installation method is the most appropriate.

Underground Duct Bank

An alternative to conventional direct burial is the use of ducts to facilitate underground installation. Although a more expensive method, the advantage of a ducted installation is that the ducts can be installed in shorter sections along the cable route leaving shorter sections of exposed trench, reducing risk and disruption to the general public.

The proposed underground power line would consist of concrete-encased duct banks installed underground a minimum of 3 feet below the ground surface. The duct banks contain larger diameter polyvinyl chloride (PVC) conduits (i.e. ducts) that conductor cables can be pulled through and smaller diameter PVC conduits for any needed or future telecommunication cables. Duct bank dimensions would be approximately 3 feet high by 3 feet wide. The duct bank configuration would be designed based on required clearances and the location of existing underground utility lines.

Underground Cable Type

Conductors that transmit electricity need to be electrically insulated. Overhead lines are insulted by air, while underground cable conductors are wrapped in layers of insulating material. Air is the simplest and cheapest insultation and the heat produced by the electricity flowing through the bare overhead conductors

[65] Detailed information concerning underground transmission lines is contained in "EPRI Underground Transmission Systems Reference Book, 2006 Edition (EPRI Product 1014840)" (Electric Power Research Institute, 2006)" (EPRI Green Book).

is removed by the flow of air over the conductors. When conductors are buried underground, robust insulation is needed to withstand the high voltage.

Advancements in cable technology have furthered the advancement of Cross-Linked Polyethylene Extruded (XLPE) Cables for underground installation which are now used as preference to the more traditional Fluid Filled Cables, especially for higher voltages up to 400 kV. XLPE cables use a central conductor which is insulated by means of cross-linked polyethylene material, which is extruded around the conductor. The absence of fluid in the cable insulation enables a more mechanically robust overall cable construction. XLPE cables require less maintenance, with no ancillary fluid equipment to monitor and maintain.

XLPE cables can be installed in areas such as tunnels, ducts and troughs and may also be buried directly.

An alternative to fluid filled or XLPE cable is the use of gas insulated lines (GIL). This system comprises aluminum/copper conductors that are supported by insulators contained within sealed tubes. These can be installed above ground, in trench or tunnel installations. The tubes are pressurized with a Nitrogen/Sulphur Hexafluoride (SF6) gas to provide the main insulation. The main advantage of GIL is that a higher cable rating can be achieved and the terminations at the cable ends have a lower cost than conventional sealing end compounds. GIL is an emerging technology and recent advancements in this technology have demonstrated that GIL may be preferable in this application. Further work is required before the Applicant will be able to commit to the underground cable type that will be used for the underground installation.

The Applicant seeks to retain future options with regards to the Project-specific application of any of these alternative technologies should environmental, technological, cost, of other considerations dictate the use of an alternative type of underground transmission system. Each of the alternative underground system is briefly described below.

- **Cross-linked polyethylene**. The XLPE system consists of three cables per phase in a concrete duct bank or buried in separate trenches. Each cable consists of a copper conductor, a semi-conducting shield, cross-linked polyethylene insulation, and an outer covering consisting of another semi-conducting shield, a metallic sheath, and a plastic jacket.
- **High-pressure, fluid-filled pipe-type cable**. A HPFF system consists of a steel pipe containing three separate conductors per phase which are insulated within the pipe by dielectric oil. The pressurized dielectric fluid prevents electrical discharges in the conductors' insulation and transfers heat away from the conductors. HPFF requires a high volume of fluid to be pumped through the system using fluid-pressurizing plants and highly charging current requirements. Compared to dielectric cables, HPFF has a higher risk of oil leak and fire.

The main advantages of solid dielectric cables compared to oil-filled cables are a decrease in fire hazard, reduced maintenance and transition space requirements, less expensive cable installation, and shorter repair time.

- **Self-contained fluid-filled pipe-type cable**. In the SCFF system, the conductors are hollow and filled with an insulating pressurized fluid. The three cables per phase are independent and are not placed together in a pipe. Each cable consists of the fluid-filled conductor insulated with high-quality kraft paper and protected by a lead-bronze or aluminium sheath which helps pressurize the conductor's fluid and a plastic jacket which keeps the water out. The fluid reduces that chance of electrical discharge and line failure.

An additional switchyard (Transition Switchyard) would need to be built at the 500-kV overhead line – cable transition point linking the Santa Rosa Substation to the underground line.

As reported by the CPUC: "Counter to popular belief, higher magnetic fields may actually occur directly over an underground transmission line than directly under an overhead transmission line. This occurs because a person standing directly over an underground transmission line is much closer to the underground line than they would be to an overhead line. However, the magnetic field will decay much more rapidly in underground transmission lines than overhead transmission lines as the horizontal distance away from the line increases. As a result, underground transmission lines generally have lower EMF levels than overhead transmission lines."66

To the extent that any of these alternative underground line technologies would allow for a reduction in the area of ground disturbance, the impacts of that alternative's selection would likely be an overall lessening of Project-related biological impacts.

10.3.5 Alternative 5 - No Project/No Build

A "No Project/No Build" alternative is expressly required by the State CEQA Guidelines (14 CCR 15126.6[e]) and has, therefore, been included herein. The "No Project/No Build" alternative serves as a baseline against which all other development options are compared. The "No Project/No Build" alternative reflects the conditions and associated environmental impacts that would predictably occur should the "Applicant's Proposed Project" be denied by regulators or should the Proposed Project's regulators fail to take affirmative action on the proposed development plan, resulting in the retention of the Project sites in their existing condition.

Should the "Applicant's Proposed Project" or an alternative not be approved, the regional need for new generation and storage facilities would continue to exist. The failure by the State, the IOUs, or another party to address those needs and/or the failure of conservation, distributed generation, and/or other efforts to increase supply or reduce demand would have regional environmental and economic consequences (e.g., increased potential for blackouts).[67] Those regional consequences are not addressed herein; rather, the "No Project/No Build" alternative focuses on the localized implications with regards to the individual Project sites.

Since it cannot be presumed that new energy development and/or conservations will occur elsewhere within the region, any election not to evaluate the continuing disparity between anticipated supply and expected demand underestimates the potential adverse impacts that would likely occur should the "Applicant's Proposed Project" not be implemented. Continuing regional energy shortfalls can be anticipated but are not direct consequences of the "No Project/No Build" alternative.

As indicated in Table E. 10-9. "No Project/No Build" Alternative - Ability to Attain Stated Goals and Objectives, a "No Project/No Build" alternative does not appear to allow for the attainment of the Proposed Project's two stated goals, does not appear to allow for the attainment of any of seven "transmission component" objectives, and does not appear to allow for the attainment of any of the five "pumped storage component" objectives.

66/ Commonwealth Associates, Inc., Feasibility of Undergrounding a Portion of the Miguel-Mission 230 kV #2 Transmission Line Project Proposed by San Diego Gas & Electric Company, February 26, 2004, p. 4.

67

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the "Applicant's Proposed Project." Although each of the Project sites are assumed to be retained in their current conditions, additional areawide development is assumed (in a manner consistent with agency projections and other related projects located within the generalized geographic scope of cumulative impacts) to occur. Related projects are assumed to include, but are not limited to, the development of the "Ortega Oaks" site for residential use (Tract Map Nos. 22626 and 22626-1).

Under the "No Project/No Build" alternative, any positive environmental and economic impacts associated with the "Applicant's Proposed Project" would be forfeited.

- **Aesthetics**. Under the "No Project/No Build" alternative, no physical change would occur to any of the sites upon which the Project's proposed facilities (including facility alternative sites) have been identified. As a result, the significant aesthetic impacts of the "Applicant's Proposed Project" would be avoided. Localized and other areawide development would continue to occur and contribute to the furtherance of urbanization throughout the southern California area, including the conversion of undeveloped properties to urban uses and the reduction in areawide open space areas.

- **Agricultural Resources**. Independent of the development of the Project or the retention of those sites (or alternative facility sites) in their current conditions, because areawide development will continue to result in the conversion of farmlands to non-agricultural uses, impacts on agricultural resources will remain cumulatively significant.

- **Air Quality**. The San Diego Air Basin (SDAB) and the South Coast Air Basin (SCAB) are classified as non-attainment for a number of criteria pollutants, including ozone and inhalable particulate mater. As a result, since areawide development will continue to occur under this alternative, air quality impacts will remain cumulatively significant.

- **Biological Resources**. Predicted areawide development will continue to contribute to the progressive fragmentation of habitat areas and decline in species diversity throughout the southern California bioregion. Independent of the development of the "Applicant's Proposed Project" or the retention of the facility sites (or alternative facility sites) in their current conditions, the long-term, areawide loss of biological resources attributable to future development will produce a significant cumulative impact on biological resources.

- **Cultural Resources**. Under this alternative, impacts upon both on-site and near-site cultural resources (prehistoric, historic, and paleontological) attributable to the "Applicant's Proposed Project" would be avoided.

- **Geology and Soils**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative for any Project-related use, no grading activities would be initiated by the Applicant. As a result, no significant geologic or soils impacts would be projected occur.

- **Hazards and Hazardous Materials**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative for any Project-related use, no significant hazards or hazardous materials impacts would be projected to occur.

- **Hydrology and Water Quality**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative for any Project-related use, no significant hydrology or water quality impacts would be projected to occur.

- **Land Use and Planning**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative for any Project-related use, no significant land use and planning impacts would be projected to occur.
- **Mineral Resources**. Since none of the Project's facility sites and none of the alternative site would be developed under this alternative, no significant mineral resource impacts would occur.
- **Noise**. Under the "No Project/No Build" alternative, none of the facility sites and none of the alternative sites would be developed for the proposed or an alternative use. Any proximal sensitive receptors would, therefore, not be subjected to either construction-term or operational noise attributable to the "Applicant's Proposed Project."
- **Population and Housing**. Under this alternative, no homes or other real property would be purchased, no residents would be displaced, and no inundation or other hazards would be created. Existing hazards would either remain at there existing levels or would increase as a result of other areawide and related project activities.
- **Public Services**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative, no significant impacts to police, fire protection, or vector control services would be projected to occur.
- **Recreation**. Since none of the Project's facility sites and none of the alternatives sites would be developed, no significant recreational impacts would be projected to occur, however benefits from the project to the recreational resource of Lake Elsinore would not be realized. These benefits include stabilization of lake elevation at 1,240 ASML, water quality improvements through oxygenation, and non-project improvements to reclaimed water treatment.
- **Transportation and Traffic**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative, no significant transportation and traffic impacts would be projected occur.
- **Utilities and Service Systems**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative, no significant impacts to potable or non-potable water services or systems would be projected to occur.
- **Energy Resources**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative, no significant energy resource impacts would be expected to occur.

Table E. 10-9. "No Project/No Build" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Non-attainment**. This alternative does not include the development of the pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	**Non-attainment**. This alternative does not include the development of the pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Non-attainment**. No high-voltage transmission lines would be constructed or improved under this alternative.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Non-attainment**. This alternative does not create additional import capacity to the SDG&E system.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Non-attainment**. This alternative does not create additional import capacity to the SDG&E system.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Non-attainment**. No new 500-kV interconnection would be constructed under this alternative.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Non-attainment**. This alternative would not result in the development of any regional 500-kV transmission line facilities.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Non-attainment**. No new electrical facilities would be constructed in the Lake Elsinore area.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	**Non-attainment**. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Non-attainment**. This alternative would not accommodate the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Non-attainment**. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Non-attainment**. This alternative would not provide additional regulation, fast responding spin, and load following capacity.

Goals and Objectives	Ability to Attain Stated Goal or Objective
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Non-attainment**. This alternative would not provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Non-attainment**. This alternative would not provide voltage support for wind integration.

Source: The Nevada Hydro Company

BLUEWATER
RENEWABLE ENERGY STORAGE

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E ENVIRONMENTAL REPORT SECTION 11 – LIST OF LITERATURE

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

The Nevada Hydro Company, Inc.

538 Monte Vista Ave
Glendale, California 91202
T: (951) 585 3277

Federal Energy Regulatory Commission
Project Number: P-14227
October 2022

EXHIBIT E – SECTION 11

List of Literature

As required under 18 CFR 4.41(f)(11), Exhibit E must include a list of all publications, reports, and other literature which were cited or otherwise utilized in the preparation of any part of the environmental report.

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BLUEWATER
RENEWABLE ENERGY STORAGE

AMENDED APPLICATION FOR LICENSE OF MAJOR UNCONSTRUCTED PROJECT

EXHIBIT E ENVIRONMENTAL REPORT SECTION 12 – CONSULTATION DETAILED DESCRIPTION OF CONSULTATION EFFORTS AND RESULTS

BLUEWATER RENEWABLE ENERGY STORAGE PROJECT

The Nevada Hydro Company, Inc.

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Federal Energy Regulatory Commission
Project Number: P-14227
October 2022

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
		Paul Anderson			

Approval for issue

Paul Anderson		2022-10-20

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Tables

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1.0 PROJECT CONSULTATION UPDATE

1.1 Introduction

The Nevada Hydro Company, Inc. (Nevada Hydro or Applicant) has undertaken considerable agency and interested stakeholder consultation since the Federal Energy Regulatory Commission ("FERC") dismissed Nevada Hydro's license application in its December 9, 2021 letter order[1] This consultation has resulted in a reconfiguration of the previously proposed Lake Elsinore Advanced Pumped Storage ("LEAPS") Project. The new Project configuration referred to as Bluewater Renewable Energy Storage Project (Bluewater Project or Project) is essentially the same as the previous LEAPS Project with important changes that the Applicant is now proposing based on further consultations with the U.S. Forest Service ("Forest Service") and with Project stakeholders. These changes are detailed in Exhibit A – Project Description and include:

1. A reconfiguration of the primary transmission line which now comprises of a single primary interconnection to Southern California Edison (SCE's) 500 kV Valley Serrano Line following an 8.5-mile 230 kV transmission line outside of Forest Service Land that can be installed underground where practical.
2. Enhancement Measures such as Lake Stabilization at 1,240 feet above mean sea level (AMSL), an increase the volume of the Upper Reservoir in Decker Canyon for additional storage to supplement lake levels during periods of drought, dissolved oxygen enrichment of water returned to the lake during the generation cycle and
3. Non Project Improvements to water quality to improve the quality of reclaimed wastewater being returned to Lake Elsinore.

The proposed changes are designed to avoid environmental impacts associated with the previous Project proposal, and to enhance lake levels and water quality in the existing, multi-purpose Lake Elsinore, which also will provide lower storage for Project operations.[2]

This section summarizes the Applicant's consultation efforts since FERC's dismissal of the application without prejudice on December 9, 2021. Following this discussion, this volume includes copies of letters and other documents associated with the Applicant's consultation efforts.

1.2 Further Consultation with Forest Service

Nevada Hydro's re-engagement with the Forest Service following its change in management highlighted a number of unresolved items, the most significant of which was the proposed 32-mile, 500-kilovolt (kV) primary transmission line traversing the Cleveland National Forest. Numerous stakeholder groups and individuals also had objected to this proposed transmission line. Nevada Hydro accordingly retained GridBright, Inc. to conduct a study of alternative transmission line routes and configurations. The study proposed an alternative primary Project transmission line that would consist of a single, 230kV line

[1] Letter from Vince Yearick, Director, FERC Division of Hydropower Licensing, to Rexford Wait, Nevada Hydro Company, Inc., Project No. 14227-003 (Issued Dec. 9, 2021).

[2] None of the proposed changes constitutes a material amendment of the application under the Commission's regulations. See 18 C.F.R. § 4.35(f). Further, as amendments intended to satisfy concerns of resource agencies regarding the previous Project proposal, the changes are expressly exempted from the Commission's material amendment rule. 18 C.F.R. § 4.35(e)(4).

approximately 8.5 miles in length routed on the outskirts of the City of Lake Elsinore and completely outside the Cleveland National Forest.

On July 25, 2022, Nevada Hydro met with Forest Service representatives to review the results of the transmission line study and new proposed Project transmission line. Nevada Hydro was informed that the Forest Service was pleased with the work done and proposal to avoid National Forest lands.

During the meeting with Forest Service on December 14, 2021, the Applicant committed to provide a workplan for geotechnical and geophysical preliminary field studies to confirm geological assumptions made in the design of the facilities. That workplan was provided to the Forest Service on January 18, 2022. During the July 25, 2022, meeting with the Forest Service the Applicant inquired about the status of the Forest Service's review of the workplan. At that time, the Forest Service representatives stated that these field studies should not proceed with these field investigations at this time but should refile its license application with FERC so that the Forest Service then could determine what, if any, such work would need to be done for purposes of advancing the application. Similarly, the Forest Service advised that no other studies needed to be completed before Nevada Hydro refiled its license application with FERC.

1.3 Letters sent to Resource Agencies and Non-Government Organizations

Letters were sent to Federal and State of California resource agencies that had previously been involved in the LEAPS Project. Initial letters were sent out that introduced the new leadership team for the Project, stated the team's commitment to meaningfully engage with these agencies through the environmental review and permitting processes and provided contact details to direct any questions or meeting requests. An example letter is provided in Attachment 12-1. A similar letter was also sent to non-government agencies that had previously provided comment to the LEAPS Project (FERC Docket 14227)

1.4 Meetings and Presentations to Key Stakeholders

The Applicant is committed to meeting with any and all stakeholders and has been actively meeting with stakeholders wherever possible. Nevada Hydro has had several meetings with the Elsinore Valley Municipal Water District to discuss, among other things, a water supply plan for the Project. In our last meeting with EVMWD on September 27, 2022, we agreed to meet with Western Water District to begin discussions regarding a water supply plan. We have also had a productive meeting with the City Manager of the City of Lake Elsinore and the City's outside legal counsel; the consultation process with the City of Lake Elsinore and EVMWD has commenced, and we plan to continue this consultation throughout the life of the Project.

Numerous presentations and information sessions have been held with interested stakeholder groups and associations including the Board of the Lake Elsinore and San Jacinto Watersheds Authority (LESJWA), the Temescal Valley Municipal Advisory Committee, and representatives from the cities of Canyon Lake, Wildomar and Riverside County. We have also met with the Elsinore Valley Chamber of Commerce and a number of private citizens of Lake Elsinore and Lakeland Village. Further details regarding this outreach are provided in Table E.12-1.

Table E.12-1:Summary of Meetings and Presentations.

Date	Type	To/With	Details
2021/12/14	Meeting	Forest Service	Identification of key outstanding issues, proposed solutions and commitment to resolution by new management.
2022/07/25	Meeting	Forest Service	Presentation of Project reconfiguration and discussion of next steps, including the fall filing of the amended application.
2022/08/02	Meeting	City of Wildomar	Presentation of Project reconfiguration and discussion of any concerns and next steps. Key issues discussed.
2022/08/03	Meeting	Elsinore Valley Municipal Water District (EVMWD)	Presentation of new ownership, management and project configuration. Discussion of any concerns and next steps. Key issues discussed.
2022/08/18	Presentation	Board of the Lake Elsinore and San Jacinto Watersheds Authority (LESJWA)	Presentation of Project reconfiguration and discussion next steps. Feedback received on stakeholders to consult.
2022/08/23	Meeting	EVMWD	Introduction and discussion current situation regarding water supply and treatment of reclaimed water in Lake Elsinore. Required action to set up meeting with subject matter experts at EVMWD regarding water supply.
2022/09/13	Meeting	Santa Ana Watershed Project Authority	Informal meeting to better understand water supply and water quality issues in the watershed.
2022/09/14	Meeting	City of Lake Elsinore	Discussion of change in Project ownership/management, and Project reconfiguration. Discussion of concerns and next steps. Many items discussed that are considered key issues for the community and suggested follow up with outside legal counsel.
2022/09/14	Public Presentation	Temescal Valley Municipal Advisory Council (TVMAC)	Presentation to TVMAC regarding revised project configuration and answer multiple questions from council members and public. No specific follow-up other than to provide a copy of presentation so it could be distributed.
2022/09/26	Meeting	City of Canyon Lake	Discussion of change in Project Ownership/management, and Project reconfiguration. Discussion of any concerns and next steps. Key issues discussed.
2022/09/26	Meeting	Elsinore Valley Chamber of Commerce (Chamber)	Discussion of change in Project Ownership/management, and Project reconfiguration. Discussion of any concerns and next steps. Many items discussed that are considered key issues for the community and suggestions on how to address. Suggestions also provided regarding Open House

Date	Type	To/With	Details
			venue, timing, and advertising; all suggestions were acted upon.
2022/09/27	Meeting	Riverside County Supervisor's Office	Discussion of changes in project leadership and direction. Feedback provided on stakeholders to consult with and planned upcoming Advisor Council meetings in Riverside communities for Project presentations. Specific request that we placed on agenda for Lakeland Community Advisory Council which is on Wednesday December 7th.
2022/09/27	Meeting	EVMWD	Met with General Manager and VP Engineering and Operations and water supply for the Project. Next step is to meet with Western Water District and develop a Water Sourcing Plan.
2022/09/27	Public Meeting	City Mayor Monthly Breakfast Meeting	Attended the Mayor's Breakfast to meet the mayor and hear about current issues and events in Lake Elsinore.
2022/10/11	Meeting	Office of Federal Congressman Mike Levin	Presentation of the new ownership and leadership of the Bluewater Renewable Energy Storage Project and discussion of key issues and next steps. No specific follow-up identified.
2022/10/11	Meeting	Office of Senator Dianne Feinstein	Presentation of the new ownership and leadership of the Bluewater Renewable Energy Storage Project and discussion of key issues and next steps. No specific follow-up identified.
2022/10/11	Meeting	Office of Federal Congressman Darrell Issa	Presentation of the new ownership and leadership of the Bluewater Renewable Energy Storage Project and discussion of key issues and next steps. No specific follow-up identified.
2022/10/11	Meeting	Office of Federal Congressman Darrell Issa	Presentation of the new ownership and leadership of the Bluewater Renewable Energy Storage Project and discussion of key issues and next steps. No specific follow-up identified.
2022/10/11	Meeting	Office of Senator Alex Padilla	Presentation of the new ownership and leadership of the Bluewater Renewable Energy Storage Project and discussion of key issues and next steps. No specific follow-up identified.
2022/10/11	Public Meeting	City Council of Lake Elsinore	Presentation to Council to advise of upcoming Open House in Lake Elsinore and invite interested stakeholders.
2022/10/12	Open House	Community of Lake Elsinore and surrounding Area	Open house described further below.
2022/10/17	Meeting	Office of Federal Congressman Ken Calvert	Presentation of the new ownership and leadership of the Bluewater Renewable Energy Storage Project and discussion of key issues and next steps. No specific follow-up identified.

1.5 Open Houses

The Project held an Open House on Saturday October 15th from 9:00 am to 2:00 pm at the Lake Community Center in downtown Lake Elsinore.

1.5.1 Venue

The venue for the open house was newly renovated Lake Elsinore Community Center on W Graham Ave in downtown Lake Elsinore. Although many venues were investigated, this venue was selected based on availability, location and suitability. Although this location was ideal for the meeting on October 15, future open houses will be held in other locations.

1.5.2 Invitation and Advertising of Open House

1.5.2.1 Invitation Cards

An invitation card was created and was emailed to 50 key stakeholders in the region. A list of those included in this invitation is included as Table E.12-2.

A copy of the Invitation Card is provided in Appendix 12-2. All individuals were requested to forward the invitation to potentially interested stakeholders and asked to post on social media channels they frequent.

Table E.12-2:Invitation Distribution List:

Organization	To	Title
The invitation was distributed via email to each of the following individuals.		
City of Lake Elsinore	Jason Simpson	City Manager
	Barbara Liebold	City Attorney
	David Mann	City Attorney
	Timothy J. Sheridan	Mayor
	Natasha Johnson	Mayor Pro Tem
	Steve Manos	Council Member
	Robert "Bob" Magee	Council Member
	Brian Tisdale	Council Member
	Alex Teahen	Management Analyst
EVMWD	Greg Thomas	General Manager
	Bonnie Woodrome	Community Affairs Supervisor
	Greg Morrison	Government Relations Officer
	Darcy M. Burke	President
	Harvey R. Ryan	Board Member
	Chance Edmondson	Treasurer
	Phil Williams	Board Member
	Andy Morris	Vice President
Chamber of Commerce	Kim Cousins	President/CEO
	Malyna	Marketing Director
Riverside County	Jeff Van Wagenen	CEO

Organization	To	Title
	Brooke Federico	Director of Strategic Communications
Riverside County Dist 1	Damian Fussel for Kevin Jeffries	Legislative Aide
	Kevin Jeffries	Supervisor
Riverside County Dist 2	Phil Paule for Karen Spiegel	Chief of Staff
	Tom Ketchum	Land Use Leg Assistant
City of Canyon Lake	Cory Gorham	Management Analyst
	Dale Welty	City Council Member
	Chris Mann	City Manager
LESJWA	Mark Norton	Authority Administrator
	Rick Whetsel	Monitoring Program Manager
	All Board Members	
	Liselle DeGrave	Public Relations Consultant
City of Wildomar	Dan York	City Manager
Lakeland Village	Community Center	
Southern California Edison	Jeremy Goldman	Government Affairs Manager
FLACC	Loy Stevens	Vice President
Forest Residents Opposing New Transmission Lines (FRONTLINES)	Jacqueline Ayer	Community Advocate
TV MAC	Jannlee Watson	Vice President
Santa Rosa West Property Owners Association	Todd Croupe	President
Sierra Club	Santa Margarita Group	Admin
Pechanga	Jacob Mejia	Director of Public Affairs
	Emily Preston	Executive Assistant
	Michele Fahley	Deputy General Counsel
CA Assembly	Kelly Seyarto	Assembly Member
	Kristy Mac Dougall	Chief of Staff
	Hildur	Field Representative
CA Senate	Melissa Melendez	Seanator
	Joe Fuentes	Field Rep for Assembly Member Seyarto
Congressman Calvert	Jason Gagnon	Senior Advisor
	Jolyn Murphy	District Director
City HOAs		
USFS	Tristan Leong	Hydroelectric Coordinator
	Scott Tangenberg	Forest Supervisor

Printed copies of the invitation cards were then hand delivered to the following locations for community distribution and placement in key stakeholders' mailboxes:

- City of Lake Elsinore
- Elsinore Valley Municipal Water District
- Lake Elsinore Valley Chamber of Commerce, which distributed at the community's Student of the Month Luncheon and Hump Day Mixer
- Lakeland Village Community Center, which is near the proposed project site.

The invitation was distributed to the following local media outlets:

- The Press-Enterprise
- The Valley News
- The Patch
- John and Ken Radio Show

1.5.2.2 Media

Media Briefings: A media interview was conducted with The Valley News on Friday, October 14 and an article is being written regarding the project and expected to be released soon.

City Council Outreach: A one-minute public announcement about the upcoming event was made by staff during Public Comment at the Council Meeting for the City of Lake Elsinore on Tuesday, October 11 at 7 p.m. View recording.

Social Media Outreach

Invitation designs were also created for posting on Facebook and Instagram and were circulated to a number of key influencers for posting on their social media channels.

The social media channels that can confirm posted the invitation include:

- City of Lake Elsinore Face Book Page which has 18,000 followers. The post had 27 reactions; 14 angry, 8 likes and 3 laughs. It was shared 17 times and 13 comments were made
- City of Lake Elsinore - Instagram Page: The City has 14,200 followers. The post had 23 likes and 1 comment
- Lake Elsinore Chamber of Commerce - Facebook Page: The Chamber has 7,300 followers. The post had 5 likes and no comments.
- Lake Elsinore Chamber of Commerce - Instagram Page: The Chamber has 566 followers. The post had 6 likes and no comments.

Community Group Shares and Comments:

- The invitation was shared with several community groups. Stop LEAPS Facebook Group: https://www.facebook.com/groups/1640975875966542
- Forest, Lake and Communities Coalition - FLACC - Facebook Page: https://www.facebook.com/STOPLEAPSINFO/
- Elevate Lake Elsinore Page: www.facebook.com/groups/565155033655013

1.5.3 Poster Boards & Maps

Five large poster boards were created that provided information on the following topics:

1. Proposed Pumped Storage Project Facilities
2. The Proposed Powerhouse and intake/Outlet Structure
3. Proposed Transmission and Electrical Facilities
4. Proposed Project Schedule
5. Regulatory Process for Approval

Copies of theses posterboards are provided in Appendix 12-2.

Four large scale maps were also displayed during the open house. One was a large scale map of the entire project including proposed pumped storage and transmission infrastructure. The other maps were detailed alignments of the primary transmission line with displayed on a aerial photomosaic base. Similar maps are provided in Exhibit G.

1.5.4 Results of Open House

Approximately 50 individuals attended. 39 attendees provided their information on the sign in sheet. 11 individuals did not want to sign in.

Each attendee was provided with a comment card and additional cards were available on tables around the room (An example comment card is provided in Attachment 2). Seven (7) comment cards were completed, and responses will be provided directly to each individual that provided a comment or asked a question.

Attendees of the open house tended to be very knowledgeable about the previous LEAPS Project, asked many informed questions and made numerous suggestions and comments about the Project. The average attendee attended the meeting for over an hour (some for quite a bit longer), enabling more detailed conversations to take place.

1.6 Indigenous Consultation Efforts

Despite numerous attempts, the Project Team has been unable to schedule a meeting with representatives of the Pechanga Band of Luiseño Indians. Outreach to the Pechanga Band included several letters from our CEO to the Band Chairman as well as phone calls and emails to other representatives, inside and outside legal counsel and other government representatives.

Consultation is an ongoing process and we will continue to attempt to engage with the Band with a goal to meaningfully engaging and working with the Band to address any concerns, and to maximize benefits for the Band. This process will continue throughout the life of the Project.

Table E.12- 3: Summary of Efforts to Engage the Pechanga Band of Luiseño Indians

Date	Type	Details
2022/07/08	Email	Legal counsel for Pechanga Band contacted counsel for Nevada Hydro requesting an in-person meeting at the Band's facilities with the company's principal investors. Counsel for Nevada Hydro responded that Nevada Hydro would be very interested in such a meeting at the Band's earliest convenience

Date	Type	Details
		and suggested the Band make arrangements directly with the Nevada Hydro principals.
2022/07/20	Letter	A letter from Nevada Hydro to Tribal Chairman Mark Macarro and legal counsel, providing details regarding new Project ownership/management, providing a project update, and requesting to meet. No response received.
2022/08/12	Email	An email from Nevada Hydro to Tribal Chairman Macarro's office, notifying of a planned trip to California by the management team, and a request to meet during the visit. No response received.
2022/09/02	Email and voicemail	Counsel for Nevada Hydro contacted counsel for Pechanga Band requesting assistance as Nevada Hydro had not been successful in scheduling a meeting with the Pechanga Band.
2022/09/09	Letter	A letter from Bluewater Renewable Energy Storage detailing the new project name, providing a project update, and requesting to meet. No response received.
2022/09/22	Email	An email from Bluewater Renewable Energy Storage notifying Tribal Chairman Mark Macarro of a planned trip to California by the management team, and a request to meet during the visit. No response received.

1.7 Federal and State Government Representatives

Meetings were held with the offices of several Senate and Federal Congressional Offices, between October 10 and 17th including the offices of US Senators Dianne Feinstein and Alex Padilla, and the offices of Congressmen Mike Levin, Darrell Issa and Ken Calvert. The dates and details of these meeting are summarized in Table E.12-1.

1.8 Planned Future Outreach Activities

Consultation is an on-going process that will extend for the life of the Project. The Project Team will continue to engage local communities and affected and interested stakeholders to listen to feedback and interests, understand community values and plans, understand how the Project may affect communities and stakeholders, and work collaboratively to identify any additional measures to mitigate or address Project effects. The Project Team will also work with communities and stakeholders to explore ways to maximize the local benefits of the Project.

Key planned engagements activities include:

- An open house in Lakeland Village and a presentation to the Lakeland Community Advisory Committee in December 2022.
- Additional Municipal and Community Advisory Board Meetings of neighboring communities in Riverside County.
- Meetings with Property and Home Owner Associations in the neighboring communities of Canyon Lake, Wildomar, Temescal Valley and Warner Springs.
- Meetings with the Offices of the State of California Government Representatives in November 2022.
- Meetings with California District offices of Federal congressional delegations and California Senate Offices in December 2022.

- Quarterly open house meetings in Lake Elsinore/Lakeland Village to provide project updates, address key topics and demonstrate how input from stakeholders is being incorporated into the Project design. Sharing communications material and Project
- Information through direct communication, project newsletters, project website, social media, news and brochures. This information will include ongoing Project engagement opportunities and the regulatory process.