Chapter 6: Detailed Discussion of Significant Impacts

6.1 Mitigation Measures Proposed to Minimize Significant Effects

6.1.1 Significant Irreversible Environmental Changes

Irreversible commitments of resources result from management decisions that affect non-renewable resources. Such commitments are considered irreversible when the affected resource deteriorates to the point that renewal can only occur over a long period of time or at great expense or when the resource has been destroyed or removed.

In accordance with the Commission requirements, the structures that are erected will be removed at the end of the federal license period. Each of the sites located on federal lands will be returned to pre-project conditions. As such, the Project's approval would not permanently alter the existing visual setting.

Since biological resources can, over time, be replaced and wetlands restored, impacts thereupon would not constitute irreversible changes. Similarly, although generally non-renewable, cultural resource and heritage sites can, in certain instances, be preserved, replaced, relocated, reused, and/or suitably documented. Impacts upon existing cultural and hydrological resources are addressed elsewhere in this PEA and are not again addressed herein.

6.1.1.2 Use of Non-Renewable Resources

During the Project's construction, fossil fuels, generally in the form of gasoline, diesel fuel, natural gas, oils, and lubricants and primarily associated with the operation of internal combustion engines will be directly utilized on and off the projects' site. Fossil fuels are consumed through the operation of equipment: (1) used in the transport of construction equipment, building materials, construction personnel, and fabricated products to and from the projects' site; (2) operated by construction workers and other personnel and utilized in the construction process; and (3) used on and off the site in the fabrication, transport, and assemblage of the equipment, materials, and products that will be used. Once consumed, fossil fuels are permanently expended and, through their consumption, cannot thus be conserved, become unavailable for other future or alternative uses, and produce often detrimental by-products, such as air pollutants.

Construction of the Project cannot currently and feasibly occur except through the use of equipment that will consume fossil fuels. Reasonable controls are already in place governing the handling, storage and disposal of petroleum products and any hazardous wastes that may be generated during and after the facilities' construction.[1]

In addition, during construction, a variety of natural resources will be consumed, including water, sand and gravel, clay, asphalt and other petrochemical-based construction materials,

[1]/ For example, as required under Chapter 6.95, Division 20, Article 1 of the H&SC (Hazardous Materials Release Response Plans and Inventory Law of 1985), businesses are required to develop a "release response plan" for hazardous material emergencies if they handle more than 500 pounds, 55 gallons, or 200 cubic yards of hazardous materials. In addition, the business must prepare a "hazardous material inventory" of all hazardous materials stored or handled at the facility over those thresholds and all hazardous materials must be stored in a safe manner.

metals, and metal products. Once utilized, these materials will be either irretrievably consumed or committed to the site on a relatively long-term basis.

The decision to approve or conditionally approve the proposed projects constitutes a relatively long-term commitment of the projects' sites for that land use. Once a particular property is allocated for a particular use, the site's availability for an alternative use either diminishes or is eliminated during the term of that use. Because the federal license will be for a definite term, at the end of which FERC and the Forest Service can direct that the projects' facilities be removed, the Project's development does not represent an irreversible and irretrievable commitment of finite real property resources.

The operation of the LEAPS project will result in the consumption of more electrical energy (at 600 MW) than will be created through the facility's operation (at 500 MW). Since the plant will operate at an efficiency of 83.3 percent net at the 500 kV primary levels, for every kilowatt of electricity used in the pumping mode, 0.832 kW of electricity will be created during the generation mode. In addition, the transmission of electrical energy will result in "line loss" or "transmission loss" (typically about 1-2 percent) which represents the energy that is consumed by the conductor (wire) generating heat during the transport of power through each line.

6.1.2 Mitigation Measures Proposed to Minimize Significant Effects

6.1.2.1 Mitigation Measures Proposed for TE/VS Interconnect Facility

Impacts arising from construction of the TE/VS Interconnect facility are identified and analyzed in Chapter 5 above. The applicant proposed mitigation measures, developed to address impacts with significance designations I (a significant impact unmitigable to less than significant) and II (a significant impact mitigable to less than significant) for the TE/VS Interconnect facility, are presented in of Attachment 5 (from the Sunrise DEIR/DEIS, with modification). In addition to the applicant proposed mitigation measures presented in Attachment 6, the TE/VS Interconnect facility would also be subject to the articles, conditions, and measures previously developed by FERC and the USFS during the FERC licensing proceedings, as detailed in Attachment 2.

6.1.2.2 Mitigation Measures Proposed for LEAPS

Impacts arising from construction of the pumped storage facility are identified and analyzed in Chapter 5 above. The applicant proposed mitigation measures, developed to address impacts with significance designations I (a significant impact unmitigatable to less than significant) and II (a significant impact mitigatable to less than significant) for the pumped storage facility, are presented in of Attachment 6 (from the Sunrise DEIR/DEIS, with modification). In addition to the applicant proposed mitigation measures presented in Attachment 6, the pumped storage facility would also be subject to the articles, conditions, and measures previously developed by FERC and the USFS during the FERC licensing proceedings, as detailed in Attachment 2.

6.2 Description of Project Alternatives and Impact Analysis

6.2.1 Introduction to the Alternatives Analysis

As indicated in the CPUC's "Information and Criteria List," the PEA shall describe 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. The specific alternative of "no project" must also be evaluated, along with its impact. The discussion of alternatives shall include alternatives capable of substantially reducing or eliminating any significant environmental effects, even if these alternatives substantially impede the attainment of the project objectives and are more costly.

As authorized therein, in addition to the information and analysis presented in this PEA, the Applicant hereby incorporates by reference the following documents: (1) "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" (CPUC/BLM, January 2008) and the "Recirculated Draft Environmental Impact Report/Environmental Impact Statement – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58" (Sunrise DEIR/DEIS); and (2) "Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, FERC/EIS-0191F" (FERC/USFS, February 2007) (FEIS).

6.2.2 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 and separated by sufficient height differential (head) to effectively generate hydropower. In describing pumped storage, FERC notes that this type of project is particularly effective at sites having high heads (i.e., large differences in elevation between the upper and lower reservoir).

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 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 pumped storage, either because of insufficient or varying water supplies or an unacceptable elevation between the upper and lower reservoirs."[2]

The area identified in the TEC study represents the only suitable location in the general project area possessing an existing water body of sufficient size to serve as a project 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

[2]/ Tudor Engineering Company, Report on Reconnaissance Level Investigation of Lake Elsinore Pumped Storage Project, June 1990, p. 1-2.

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, exported, and then produced in distant areas, pumped storage is dependent upon the existence of definable variables that impose real-world restrictions on its duplication.

As such, the primary goals of the 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 facility; and (2) connect the pumped storage facility to 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 objectives have been formulated. Because they serve as the basis for identification of Project alternatives, the Project's objectives are repeated below.

I. The objectives of the "transmission component" of the Project include:

1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.
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.
3. Provide at least 1,100 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.
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.
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.
6. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.

II. The objectives of the "pumped storage component" of the 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 the LEAPS 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 for wind energy integration in the southern California electrical region.

Each of the ten alternatives recommended for advancement have been examined in the context of each alternative's ability to fulfill, in whole or in part, each of the goals and objectives identified herein. The findings of that analysis are outlined in Table 6.2-1 (Each Alternative's Ability to Fulfill the Identified Project Objectives). The following symbols are used to reflect the degree to which each alternative serves to fulfill, in whole or in part, the Project's goals and objectives: (1) the alternative allows for full attainment of the identified goal or objective ("●"); (2) the alternative may allow for partial attainment of the identified goal or objective ("O"); and (3) the alternative would not allow for the attainment of the identified goal or objective ("-").

6.2.3 Alternatives Considered but Eliminated from Further Analysis by the Applicant

6.2.3.1 "Non-Wires" Alternatives

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 Project involves two of the three DOE-identified strategies for addressing long-term congestion problems (new generation [pumped storage] and transmission facilities).[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 gird, 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

[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 proposed project's generation (pumped storage) component has been federally declared an "advanced transmission technology." As such, pumped storage might be more appropriately categorized as a transmission facility rather than as a generation asset.

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 of load. [4] Conservation (demand-side management) can reduce demand for power, thus reducing or eliminating the need for new transmission lines."[5]

As indicated by the CEC, "the State currently uses 265,000 GWh of electricity per year. Consumption is growing two percent annually. Peak demand is growing at about 2.4 percent per year, roughly equivalent of 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 so transmission of power is required. 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 "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 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.

- **"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 CPUC has long

[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.

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 on scale sufficient to provide energy storage capacity comparable to that of LEAPS.

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 distribution capacity, relieve transmission and distribution system bottlenecks, and support power system maintenance or restoration operations with generation of temporary backup power.[15]

[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.
[15]/ Arthur A. Little, Reliability and Distributed Generation, 2000, p. 16.

Table 6.2-1 Each Alternative's Ability to Fulfill the Identified Project objectives

Goals and Objectives	P	Alternatives									
		1	2	3	4	5	6	7	8	9	10
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.	●	●	-	●	●	●	●	●	●	-	-
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.	●	●	-	●	●	●	●	●	●	-	-
Objectives											
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	●	○	●	●	●	●	●	●	●	-	-
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.	●	-	●	●	●	●	●	●	●	-	-
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.	●	-	●	●	●	●	●	●	●	○	-
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.	●	○	●	●	●	●	●	●	●	-	-
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.	●	●	●	●	●	●	●	●	●	-	-
I.6. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	●	●	●	●	●	●	●	●	●	-	-
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.	●	●	-	●	●	●	●	●	●	-	-

Notes: (P) "Applicant's Proposed Project"; (1) "LEAPS Only" Alternative; (2) "TE/VS Interconnect Only" Alternative; (3) "Alternative LEAPS Powerhouse/Substation Site" Alternative; (4) "Alternative LEAPS Upper Reservoir Site" Alternative; (5) "Alternative Lake Swithyard Site" Alternative; (6) "Alternative Case Springs Substation Site" Alternative; (7) "Santa Rosa-GIL Transition Station Underground" Alternative; (8) "Alternative Transmission Line Underground Technology" Alternative; (9) "New Non-Wires In-Area Renewable Generation" Alternative; and (10) "No Project/No Build" Alternative.

Source: The Nevada Hydro Company

Notwithstanding these potential benefits, a potential "distributed generation" alternative was rejected based on the following factors: (1) effectuation is infeasible[16] since it would be subject to the actions of other parties and could not be effectively implemented by the Applicant; (2) this alternative would not facilitate the expansion of the State's backbone transmission and generation systems; and (3) this alternative fails to substantially fulfill the Project's primary goals and objectives. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

- **"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 is the least cost, most reliable, and most environmentally-sensitive resource, and minimizes our contribution to climate change."[17]

  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]

  The challenge with energy-efficiency measures is to achieve a sufficient on-peak load reduction to substantively contribute to the deferral of the need for the development of new generation (pumped storage) or transmission facilities.

  The CEC has formulated a set of short-term and long-term goals for Statewide energy-efficiency programs. Short-term goals seek to achieve a 7,000 GWh savings per year (over a 2004 base year) by 2006 and a 30,000 GWh savings by 2013. Achieving recommended long-term goals "would be equivalent to reducing per capita electricity use by 0.3 percent per year over the next decade from 7,145 kWh per capita in 2003 to 6,930 kWh per capita in 2013. This is also equivalent to meeting roughly 50 percent of the projected increase in electricity usage over the next decade."[19] The CEC, however, concluded that "[a]chieving the additional savings necessary to achieve a sustained reduction of 0.3 percent per capita per year would be unprecedented in the 'history of energy policy.'"[20]

  A potential "energy efficiency measures" alternative was rejected based on the following economic, environmental, legal, social, and technological factors: (1) effectuation is infeasible since it would be subject to the actions of other parties and could not be effectively implemented by the Applicant; (2) this alternative would not facilitate the expansion of the State's backbone transmission and generation systems; and (3) this alternative fails to substantially fulfill the Project's primary goals and objectives. As a

[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.
[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.
[19]/ *Ibid*., p. 20.
[20]/ *Ibid*., p. 32.

result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

- **"Demand-Response Strategies" Alternative**. As indicated by the CEC: "By reducing system loads during critical-peak times, demand response 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."[21]

  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.[22]

  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."[23]

  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."[24] 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-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.

[21]/ 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.
[22]/ *Op. Cit.*, Comparative Study of Transmission Alternatives: Background Report, pp. 15-16.
[23]/ Federal Energy Regulatory Commission, Increasing Costs in Electric Markets, Item No. A-3, June 19, 2008, p. 14.
[24]/ 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.

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.[25] The CPUC (CPUC Docket No. D.06-03-024) has acknowledged that "[b]oth 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."[26]

As indicated by the CAISO, one of the barriers to DR programs "is the availability of hourly meters for residential customers, unless the CPUC adopts a default retail tariff for all customers that passes through the hourly wholesale price in the hourly retail rate that customers face, it is unlikely that active demand-side participation in the wholesale market will materialize."[27]

A potential "demand-response strategy" alternative was rejected based on the following economic, environmental, legal, social, and technological factors: (1) effectuation is infeasible since it would be subject to the actions of other parties and could not be effectively implemented by the Applicant; (2) this alternative would not facilitate the expansion of the State's backbone transmission and generation systems; and (3) this alternative fails to substantially fulfill the Project's primary goals and objectives. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

As described in the Sunrise DEIR/DEIS, although it cannot be strictly interpreted as such since it would likely involve the construction of new transmission facilities, a potential variation of a "non-wires" alternative is identified in Section 6.2.4.4 (Alternative No. 9 - "New Non-Wires In-Area Renewable Generation" Alternative) herein. Under that alternative, other new renewable projects would be developed within the San Diego area which did not require the construction of new transmission lines as the alternative's "primary component."[28]

6.2.3.2 "Alternative Transmission Routing" Alternatives[29]

Potential alternative transmission routing alternatives can be drawn from a number of sources. Alternatives considered by the Applicant include those presented in the following documents and planning studies.

[25]/ 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.
[26]/ 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.
[27]/ Wolak, Frank A., Memorandum: Summary of the Market Surveillance Committee Meeting of August 8, 2006, California Independent System Operator, August 31, 2006, pp. 7-8.
[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.
[29]/ The consideration of "alternative transmission routing" differs from the subsequent assessment of "alternative transmission alignments." Under the former option, routes other than those described in the FLA, DEIS, and FEIS were considered. Under the latter, some of the alignment variations presented in the FLA, DEIS, and FEIS are examined.

- **"Valley-Rainbow Interconnect Project" Alternative**. On March 23, 2001, SDG&E submitted an application (CPUC Docket No. A.01-03-036), seeking authorization from the CPUC for the Valley-Rainbow interconnect project. The 31 mile Valley-Rainbow project was proposed as an interconnection between SDG&E's existing 230 kV transmission system (at the proposed Rainbow substation to be located in the unincorporated community of Rainbow in San Diego County) and SCE's existing 500 kV transmission system (at the existing Valley substation located in the unincorporated community of Romoland in Riverside County).

  As indicated by the CAISO: "The Valley-Rainbow Project is necessary to reliably serve the growing electric demands in the San Diego area. In addition, the project is an important component of a comprehensive strategy to enhance access by consumers in San Diego and other parts of California to reasonably priced, efficient and environmentally superior generation. . .the Valley-Rainbow Project should now be evaluated by the Board as part of a broad strategy by the State of California to put into place a robust transmission system to support reliable service to customers. In this regard, the Valley-Rainbow Project provides benefits to consumers in San Diego and the rest of California." The CAISO further indicated that, "[u]nlike the route proposed by SDG&E, the route associated with the Lake Elsinore project will have minimal impacts on residential communities. SDG&E can and should be encouraged to explore the Forest Service land alternative and other alternatives that would minimize impacts on affected communities."[30] As indicated by SDG&E: "Can the TE/VS-LEAPS project be configured to provide the same benefits as the Valley-Rainbow Interconnection (VRI)?" The answer is "'yes,' provided that the necessary associated projects and upgrades are identified and built. . .the TE/VS-LEAPS can be configured to provide the same benefits as VRI."[31]

  On March 30, 2001, without selecting a preferred near-term alternative and without regards for routing, the CAISO Board of Governors adopted a resolution finding that a new 500 kV project(s), such as the Valley-Rainbow Interconnect Project, is needed to address the identified reliability concerns of San Diego and the southern Orange County portion of the ISO grid beginning in 2004. The CAISO Board of Governors' formal needs determination neither specifically identified a precise transmission for a new 500 kV transmission line or route serving San Diego nor contained any expiration terms or conditions. As such, the CAISO's actions serve as a relevant and applicable needs determination applicable to the Applicant's Project.

  On October 23, 2002, the assigned Administrative Law Judge (ALJ) issued a decision denying, without prejudice, SDG&E's application to construct the Valley-Rainbow project. The ALJ found that SDG&E would continue to meet established reliability criteria for the region until 2008. Utilizing a five-year planning horizon (2001-2006), the ALJ concluded that the Valley-Rainbow project was not then needed for reliability purposes. The ALJ also concluded that the Valley-Rainbow project could not be justified

[30]/ Memorandum from James Detmers, Acting Vice President of Operations, Armando J. Perez, Director of Grid Planning, and Steve Greenleaf, Director of Regulatory Policy, California Independent System Operator to the CAISO Board of Governors, Re: Valley-Rainbow Transmission Project, March 23, 2001, p. 1.

[31]/ San Diego Gas & Electric Company, Attachment ALT-36, Response ALT-36, Sunrise Powerlink Project (A.06-08-010), SDG&E Response to Data Request No. 1, November 17, 2006.

on economic grounds. An "Alternate Proposed Decision," which was not adopted, concludes that SDG&E has a reliability need in 2006, which fell within the required five-year planning horizon.

On December 19, 2002, the CPUC rejected SDG&E's application (CPUC Docket No. D.02-12-066, rehearing denied in D.03-05-038) based on need and cost-benefit analysis. As reported by the CEC, the CPUC "denied the CPCN despite the fact that the California CAISO had approved the [Valley-Rainbow] project and directed SDG&E to construct the line in order to satisfy a need it had identified. CAISO provide a witness to testify to that effect in the hearing. Nonetheless the CPUC disagreed and found that need had not been demonstrated."[32]

The CPUC issued a subsequent decision stating: "SDG&E will have a capacity deficiency in 2008 under N-1/G-1 conditions."[33] A "reasonably foreseeable forecast" deficiency of 301 MW was documented by 2010 and a 571 MW deficiency was documented by 2012 with the SDG&E service area.[34] The CPUC's decision directed the preparation of "a document that provides a preliminary alternatives feasibility analysis based on the environmental information developed to date."[35]

The Applicant has considered the analysis presented in the Valley-Rainbow proceedings (CPUC Docket No. A.01-03-036) and concurs that the "Valley-Rainbow" alternatives neither: (1) allow for the attainment of the Project's primary goals and objectives; nor (2) have the potential to substantially reduce the Project's potential environmental effects. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

- **"Valley-Rainbow Interconnect-CPUC/BLM Alternative Alignments" Alternative**. An alternative analysis for the Valley-Rainbow project was prepared in response to the ALJ's October 21, 2002 and December 19, 2002 rulings, directing the CPUC to prepare a document providing a preliminary alternatives feasibility analysis for the Valley-Rainbow project. The alternatives screening process culminated in the identification and screening of about 45 alternatives, including the transmission lines associated with the Applicant's Project.
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As indicated in the CPUC/BLM analysis, those alignments "would follow transmission paths across the Trabuco [Ranger] District and would result in a project that is electrically the same or similar to the proposed [Valley-Rainbow] project. Alternative 1 would be essentially the same as the proposed project, since the 500 kV line would still connect between the existing Valley and proposed Rainbow substations. Alternative 2 would entail construction of a new 500 kV switching station on or near the Valley-Serrano 500 kV right-of-way, located about 15 miles west of the existing Valley substation, and the relocation of the Rainbow substation site somewhere to the west of Rainbow, along the existing Talega-Escondido right-of-way. The 230 kV system changes would remain as

[32]/ *Op. Cit*., Comparative Study of Transmission Alternatives: Background Report, p. 38.
[33]/ "N-1" refers to the outage of the most critical transmission network element. "G-1" refers to the outage of the most significant in-basin generator.
[34]/ California Public Utilities Commission, Opinion on the Need for Additional Transmission Capacity to Serve the San Diego Gas & Electric Company Service Territory, Decision 02-12-066, December 19, 2002, p. 52.
[35]/ *Ibid*., p. 71.

described in the proposed project. Since this alternative is electrically the same as the proposed project, it would meet all project objective criteria."[36]

Other non-eliminated alternatives identified by the CPUC/BLM included: (1) Eastern Riverside County – Route North of Vail Lake (45 miles); (2) Eastern Riverside County – Route South of Vail Lake (47 miles); (3) Alternative 1 (SDG&E Southeast Route) (57-61 miles)[37]; and (4) Alternative 3 (46 miles).

As noted in correspondence from the CAISO: "While the ISO is not responsible for the specific siting of transmission lines, we are responsible for identifying transmission system technical needs and recommended transmission system additions. Currently, there is only one major transmission interconnection between the San Diego area and the rest of the State of California. This line has limited capacity to import or export power and creates a bottleneck that, absent transmission system additions, will seriously impact the reliability of electric service to the San Diego area in the future. In March 2001, the ISO recommended that a new 500 kV transmission line be constructed linking the San Diego area with the rest of the State's electrical grid by the year 2004. Based on this recommendation, the San Diego Gas and Electric Company filed an application for a Certificate of Public Convenience and Necessity for such a line (Valley-Rainbow 500 kV Transmission Project) with the California Public Utilities Commission. The CPUC application identified several potential routes for such a line, however, during the permitting process, essentially all of the routes being considered for this line were deemed to be infeasible. A transmission line through the Cleveland National Forest, as suggested in the potential legislation, would be the functional equivalent of the Valley-Rainbow 500 kV Transmission Project. Such a line would provide a major benefit to the San Diego area well into the future by helping to ensure system reliability, by reducing power costs and by helping connect a proposed new pumped hydro project in the area, the Lake Elsinore Advanced Pumped Storage facility."[38]

The Applicant has considered the analysis presented by the CPUC and the United States Department of the Interior, Bureau of Land Management (BLM) in the "Final Notice – CPUC/BLM Notice Regarding Conclusions on EIR/EIS Alternatives to the Proposed Sunrise Powerlink Project – Results of the Second Scoping Process" and concluded that the Valley-Rainbow alternatives which are identified therein neither: (1) allow for the attainment of the Project's primary goals and objectives; nor (2) have the potential to substantially reduce the Project's potential environmental effects. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

[36]/ California Public Utilities Commission and United States Department of the Interior – Bureau of Land Management, Interim Preliminary Report on Alternatives Screening for: San Diego Gas & Electric Company Valley - Rainbow 500kV Interconnect Project CPCN Application No. 01-03-036 U.S. BLM Case No. CACA-43368, November 2002, p. ES-29.

[37]/ As indicated in the CPUC/BLM Valley-Rainbow analysis, PDR Alternative 1 would traverse designated roadless areas, the Southwest Riverside County Multi-Species Reserve, and had the potential to adversely impact both the Palomar Observatory and Palomar Mountain State Park. Since the Eastern Riverside County alternative would introduce additional impacts beyond those associated with the LEAPS and TE/VS Interconnect projects, that alternative was eliminated since it would not likely result in the avoidance or minimization of the projects' significant environmental effects.

[38]/ Letter from Terry M. Winter, President and Chief Executive Officer to Honorable Spencer Abraham, Secretary of Energy, and Honorable Gale A. Norton, Secretary of Interior, Subject: HR 1230, April 16, 2003, p. 2.

- **"Southwest Transmission Expansion Plan" Alternative**. In 2002, the CAISO established the "Southwest Transmission Expansion Plan" (STEP) as a collaborative ad-hoc study group whose goal was "[t]o provide a forum where all interested parties are encouraged to participate in the planning, coordination, and implementation of a robust transmission system between Arizona, Nevada, Mexico, and southern California areas."[39] Studies conducted by the CAISO (Kyei Report) concluded that a new high-voltage electric transmission line between Riverside and San Diego Counties was critically needed to serve future load growth. "Studies conducted by the Southwest Transmission Expansion Plan in 2003 indicated that a new 500 kV line into San Diego will be needed to serve future load growth.[40]

  As further indicated in the Kyei Report: "Several alternative transmission lines were considered from the Imperial Valley into San Diego as well as the new 500 kV line associated with the Lake Elsinore Advanced Pumped Storage Project."[41] Options examined included: (1) Imperial Valley-Ramona 500 kV line (Imperial Valley-San Diego Expansion Plan); (2) Talega-Escondido/Valley-Serrano 500 kV Interconnect Project (without LEAPS); (3) Talega-Escondido/Valley-Serrano 500 kV line (with LEAPS); and; (4) both the Imperial Valley-San Diego Expansion Plan and Talega-Escondido/Valley-Serrano 500 kV line (without LEAPS). The Imperial Valley-San Diego Expansion Plan (ISEP) project subsequently became SDG&E's Sunrise Powerlink Project (SRPL).

  The "Talega-Escondido/Valley-Serrano 500 kV Interconnect (without LEAPS)" option identified in the Kyei Report is examined as "Alternative No. 2 ("TE/VS Interconnect Only" Alternative) herein. The "Talega-Escondido/Valley-Serrano 500 kV line (with LEAPS)" option identified in the Kyei Report constitutes the Applicant's Project as addressed throughout this PEA.

  With the exception of the two variations of the Kyei Report's "new 500 kV line associated with the Lake Elsinore Advanced Pumped Storage Project" (i.e., LEAPS and TE/VS Interconnect) which are addressed herein, the Applicant has considered the analysis presented in the Kyei Report and concluded that the alternative identified therein neither: (1) allow for the attainment of the Project's primary goals and objectives; nor (2) have the potential to substantially reduce the Project's potential environmental effects. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

- **"South Regional Transmission Plan" Alternative**. In 2004, the CAISO initiated the "CAISO South Regional Transmission Plan" (CSRTP) for the purpose of assessing the following three major transmission projects in the southern California region: (1) Tehachapi project (transmission infrastructure to accommodate wind generation in the Tehachapi area); (2) Sun Path project (combination of SDG&E's SRPL and Citizens Energy's and Imperial Irrigation District's Phase 2 Green Path projects connecting Imperial Valley to the San Diego area); and (3) LEAPS (pumped storage plant and

[39]/ California Independent System Operator, Southwest Transmission Expansion Plan, January 17, 2003, p. 1.
[40]/ Kyei, John, Comparative Reliability Evaluation for Alternative New 500 kV Transmission Lines into San Diego, Grid Planning Department, California Independent System Operator, April 17, 2004.
[41]/ *Ibid*., p. 2.

associated transmission line). The CAISO recognized "[e]ach of these projects offer unique reliability and economic benefits."[42]

The "LEAPS project (pumped storage plant and associated transmission line)" constitutes the Applicant's Project as addressed throughout this PEA. With the exception of the LEAPS and the TE/VS Interconnect, the Applicant has considered the projects identified by the CAISO and concluded that the alternative projects identified therein neither: (1) allow for the attainment of the Project's primary goals and objectives; nor (2) have the potential to substantially reduce the Project's potential environmental effects. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

- **"Southwest Transmission Line Project" Alternative**. In 2006, the Imperial Irrigation District (IID) and the BLM jointly prepared environmental documents[43] for a 118 mile, 500 kV transmission line extending from Blythe to SCE's Devers substation. Variation of that project included the construction of the transmission line within and adjacent to the existing right-of-way (ROW) for SCE's Devers-Palo Verde No. 2 transmission line. Four alternatives were examined, including a second northern route alternative, a southern route alternative which including upgrading and use of certain existing transmission facilities, a third northern route, and a "no action" alternative.

  The Applicant has considered the analysis presented in the "Final Environmental Impact Statement/Environmental Impact Report – Desert Southwest Transmission Line Project" and concluded that the alternative projects identified therein neither: (1) allow for the attainment of the Project's primary goals and objectives; nor (2) have the potential to substantially reduce the Project's potential environmental effects. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

- **"Devers-Palo Verde No. 2 Transmission Line Project" Alternative**. In 2006, BLM and the CPUC prepared environmental documents[44] for a new 230 mile 500 kV transmission line from Harquahala substation (Arizona) to SCE's Devers substation (North Palm Springs), following SCE's existing Devers-Palo Verde No. 1 transmission line. The Devers-Palo Verde No. 2 (DPV2) transmission line project also included upgrades to existing transmission lines located to the west of the Devers substation (West of Devers). The Devers-Valley No. 2, a new 42 mile 500 kV line following the existing SCE Devers-Valley No. 1 500 kV transmission line, was identified by SCE as the preferred project. A total of eight alternatives were evaluated therein.

  The Applicant has considered the analysis presented in the "Final Environmental Impact Report/Environmental Impact Statement for the Proposed Devers-Palo Verde No. 2 Transmission Line Project" and concluded that the alternative projects identified therein

[42]/ *Op. Cit*., CAISO South Regional Transmission Plan for 2006, Presentation at CEC Intermittency Analysis Project, Energy Commission Staff Workshop, p. 4.
[43]/ United States Department of the Interior, Bureau of Land Management and Imperial Irrigation District, Final Environmental Impact Statement/Environmental Impact Report – Desert Southwest Transmission Line Project, September 15, 2006.
[44]/ United States Department of the Interior, Bureau of Land Management and California Public Utilities Commission, Final Environmental Impact Report/Environmental Impact Statement for the Proposed Devers-Palo Verde No. 2 Transmission Line Project (Application No. A.05-04-015), October 2006.

neither: (1) allow for the attainment of the Project's primary goals and objectives; nor (2) have the potential to substantially reduce the Project's potential environmental effects. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

- **"Sunrise Powerlink Project" Alternative**. In January 2008, in response to SDG&E's filing for an application for a CPCN (CPUC Docket No. A.06-08-010), the CPUC, acting in combination with the Bureau of Land Management (BLM) released the Sunrise DEIR/DEIS. The Sunrise DEIR/DEIS, in combination with the scoping process that preceded its release and the "Alternative Screening Report" (Appendix 1) included therein, contained a detailed analysis of a broad array of alternatives formulated in response to the stated objectives of the SRPL project. The Applicant has fully considered the alternatives analysis presented in the SRPL proceedings (CPUC Docket No. A.06-08-010).

  The Sunrise DEIR/DEIS concludes that the "LEAPS Transmission-Only Alternative is found to be the Overall Environmentally Superior Transmission Line Route Alternative."[45] However, when the transmission and pumped storage components where combined, the potential impacts of that larger project were found to exceed a number of the other alternatives addressed therein. Similarly, "the LEAPS Transmission-Only Alternative is found to be inferior to both New In-Area Renewable Generation and New In-Area All-Source Alternatives."[46] As such, although the objectives for the SRPL differ from those established for the Applicant's Project, each of the alternatives evaluated in the Sunrise DEIR/DEIS were initially considered in the derivation of this alternatives analysis.

  Each of the following alternatives are as represented in the Sunrise DEIR/DEIS. Since that document is incorporated herein by reference, the following description of each of the alternative evaluated in the Sunrise DEIR/DEIS is intended to only be synoptic in nature.

  - ◊ **"SDG&E Proposed Sunrise" Alternative**. SDG&E proposes to construct a new 91-mile, 500 kV electric transmission line from the Imperial Valley substation (in Imperial County near the City of El Centro) to a new Central East substation (in central San Diego County, southwest of the intersection of County Highways S22 and S2) and a new 59-mile, 230 kV transmission line that includes both overhead and underground segments from the Central East substation to SDG&E's existing Penasquitos substation (in the City of San Diego).

    Because it neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources, implementation of the "SDG&E Proposed Sunrise" alternative would not allow for the attainment of the Project's primary goals and objectives. As evidenced by the findings presented in the Sunrise DEIR/DEIS, with the exception of the "LEAPS transmission only" alternative, none of the transmission line alternatives examined therein would reduce the potential environmental impacts associated with the TE/VS Interconnect. As a result, the Applicant does

[45]/ California Public Utilities Commission and 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, pp. ES-64 and ES-65.
[46]/ *Ibid*., p. ES-65.

not suggest that this alternative be brought forward by the CPUC for comparable review.

◊ **"Interstate 8" Alternative**. In the context of the Sunrise DEIR/DEIS, the "I-8" alternative allows for the attainment of the basic objectives of the "SDG&E Proposed Sunrise" alternative but presents an alternative transmission line routing option. The route of the "I-8" alternative would be located adjacent to the existing 500 kV Southwest Powerlink (SWPL) transmission line for the first 37.5 miles, paralleling the I-8 Freeway. The route begins at the Imperial Valley substation, paralleling the SWPL to a point about six miles west of the San Diego/Imperial County line. At that point, the line would turn northwest, passing less than one mile southwest of the southwest corner of Anza-Borrego Desert State Park (ABDSP) and crossing the I-8 Freeway just west of the BLM Carrizo Gorge Wilderness Area and one mile east of the community of Boulevard. The "I-8" alternative diverges from the SWPL one mile due south of the southwestern ABDSP boundary and follows a northwesterly route.

Because it neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources, implementation of the "I-8" alternative would not allow for the attainment of the Project's primary goals and objectives. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

◊ **"B-C-D" Alternative**. As indicated in the Sunrise DEIR/DEIS, the "B-C-D" alternative allows for the attainment of the basic objectives of the "SDG&E Proposed Sunrise" alternative but presents an alternative transmission line routing option allowing for the avoidance of ABDSP. This alternative would diverge from the "I-8" alternative southeast of the community of Boulevard where it would cross the I-8 Freeway to the north. The route would pass one mile east of Boulevard and, heading north-northwest, generally parallel McCain Valley Road. The route would enter the Cleveland National Forest (CNF) and head west crossing Thing Valley Road (La Posta Truck Trail), Fred Canyon Road, and the Pacific Crest National Scenic Trail. After passing through the CNF, the route would join the "I-8" alternative.

Because it neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources, implementation of the "B-C-D" alternative would not allow for the attainment of the Project's primary goals and objectives. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

◊ **"Route D" Alternative**. As indicated in the Sunrise DEIR/DEIS, the "Route D" alternative allows for the attainment of the basic objectives of the "SDG&E Proposed Sunrise" alternative but presents an alternative transmission line routing option allowing for the avoidance of ABDSP. The "Route D" alternative would be a 500 kV alternative that would diverge from the "I-8" alternative and pass

through the Boulder Creek Valley north of the town of Descanso, passing between the Cuyamaca Ranch State Park and Capitan Grande Reservation. The "Route D" alternative would join the SDG&E preferred route between Santa Ysabel and Ramona.

Because it neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources, implementation of the "Route D" alternative would not allow for the attainment of the Project's primary goals and objectives. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

◊ **"Modified Route D" Alternative**. As indicated in the Sunrise DEIR/DEIS, the "Modified Route D" alternative allows for the attainment of the basic objectives of the "SDG&E Proposed Sunrise" alternative but presents an alternative transmission line routing option allowing for the avoidance of ABDSP and a reduction of impact to the CNF. This 39 mile alternative would replace a segment of the "I-8" alternative.

Because it neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources, implementation of the "Modified Route" alternative would not allow for the attainment of the Project's primary goals and objectives. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

◊ **"New In-Area Renewable Generation" Alternative**. Notwithstanding its inclusion in the Sunrise DEIR/DEIS, since it involves the development of new "renewable" generation facilities, this alternative would not be appropriately characterized as an "alternative transmission routing alternative" but is nonetheless examined herein.

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 SRPL. As indicated in the Sunrise DEIR/DEIS, this alternative would develop nearly 1,000 MW of Nameplate Capacity and 500 MW of Firm On-Peak Capacity by 2016; however, no single in-area generation project by itself would be likely to produce the necessary capacity to serve as a viable alternative to the SRPL.

As indicated in the Sunrise DEIR/DEIS, based on all the factors described therein, "the environmental ranking of the environmentally superior transmission and non-wires alternatives from most environmentally superior to least environmentally superior is as follow: (1) New In-Area All-Source Generation Alternative; (2) New In-Area Renewable Generation Alternative; (3) LEAPS Transmission-Only Alternative."[47]

[47]/ *Ibid*., p. H-137.

Although the "New In-Area Renewable Generation" alternative would not improve transmission access to the location-constrained LEAPS area, in the Sunrise DEIR/DEIS, this alternative was determined to be "environmentally superior" to the transmission component of the Applicant's Project and has the potential to address a number of proposed Project's objectives. As such, a "New In-Area Renewable Generation" alternative is further discusses in Section 6.2.4.4 (Alternative No. 9 - "New Non-Wires In-Area Renewable Generation" Alternative) as an alternative that may warrant further consideration by the CPUC.

◊ **"New In-Area All-Source Generation" Alternative**. Notwithstanding its inclusion in the Sunrise DEIR/DEIS, since it involves the development of new "all-source" generation facilities, this alternative would not be appropriately characterized as an "alternative transmission routing alternative" but is nonetheless examined herein.

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). The capacity provide by conventional generation projects under this alternative would include at least 620 MW form 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.

Because this alternative would not improve transmission access to the location-constrained LEAPS area, allow for the storage of excess off-peak energy production in the CAISO region, or effectively provide for the integration of intermittent renewable resources, implementation of the "New In-Area All-Source Generation" alternative would not allow for the attainment of the Project's primary goals and objectives. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

▪ **"Report for SDG&E's Transmission Comparison Study" Alternative**. In 2005, SDG&E conducted a "transmission comparison screening study" in order "to evaluate various transmission alternatives and to select the best alternative(s) to: increase import capability into the SDG&E service area to meet a grid reliability deficiency in 2010, reduce congestion and reliability must run (RMR) costs for California ratepayers, [and] access, at an acceptable cost, renewable resources in support of goals set by the State of California and the CPUC. SDG&E reported that "the highest ranking alternative" was the "Full Loop" alternative. The "Full Loop options are so named because they complete the 500 kV loop from Palo Verde [Arizona] to SDG&E to SCE and then back to Palo Verde [Arizona] by adding the portion from SDG&E's 500 kV to SCE's 500 kV system."[48]

[48]/ San Diego Gas and Electric, Report for SDG&E's Transmission Comparison Study, October 5, 2005, pp. 1-2 and 29.

SDG&E stated: "To the extent the transmission associated with the LEAPS project follows the same corridor as the Central-Serrano/Valley portion of the Full Loop, Imperial-Central Serrano/Valley 500 kV alternative, the transmission associated with the LEAPS project can be considered to constitute the bulk of the northern segment of the Imperial Valley-Central – Serrano/Valley 500 kV alternative."[49] This would suggest that, from a cumulative perspective, the Applicant's Project could then be described as the "north segment of the Imperial Valley-Central-Serrano/Valley 500 kV" alternative.

SDG&E's December 2005 CPCN application, as addressed in the Sunrise DEIR/DEIS, included the "Imperial Valley-Central-Serrano/Valley" (Full Loop) alternative. As proposed, this alternative would connect SDG&E's 500 kV system to SCE's 500 kV system through a proposed new 500/230 kV Central substation, feeding into SDG&E's existing 230 kV system near the center of SDG&E's system, and then connects to SCE's 500 kV system.[50] The "Full Loop" alternative "would complete the 500 kV loop through southern California, connecting SCE's 500 kV Palo Verde-Devers-Valley-Serrano system to SDG&E's 500 kV Southwest Powerlink."[51] As indicated by SDG&E: "The Technical Working Group determined that the "Full Loop" option and the Sunrise Powerlink were the best performing transmission alternatives with respect to grid reliability and technical performance, accessing areas of high renewable resource potential, and providing economic benefits."[52] Under this alternative, SDG&E's proposed 500 kV transmission line extending from the Imperial Valley substation to the proposed new Central substation would be further extended northward, connecting SDG&E's proposed new 500 kV system to the Serrano/Valley segment of SCE's 500 kV system.

SDG&E's initial application noted that this alternative would "free up some amount of capacity on the existing Imperial Valley-Miguel 500 kV transmission line (the Southwest Powerlink or 'SWPL') and thereby allow renewable energy resources to economically connect to this existing 500 kV line. This could encourage renewable energy development that might otherwise not be feasible."[53]

"SDG&E has performed several sensitivities involving the Sunrise Powerlink. The first sensitivity assumes that in addition to the Sunrise Powerlink, the Lake Elsinore Advanced Pump Storage project is constructed and that the southern terminus of the associated 500 kV transmission is located at a new 500/230 kV substation on SDG&E's existing SONGS-Talega 230 kV line. The second sensitivity assumes that in addition to the Sunrise Powerlink, the LEAPS project is built and the southern terminus of the associated 500 kV transmission is located at Central substation. Both sensitivities include two 250 MW pump/generator sets interconnected with the CAISO grid via a 500 kV line connecting to the SDG&E system and a 500 kV line connecting to the SCE system on SCE's existing Serrano-Valley 500 kV line. The first sensitivity represents SDG&E's understanding of the LEAPS project sponsors' current proposal for integrating the LEAPS project into the CAISO grid. The second sensitivity represents a logical modification of the LEAPS project sponsors' current proposal because it eliminates the

[49]/ *Ibid*., p. 2.
[50]/ San Diego Gas & Electric Company, Sunrise Powerlink Transmission Project – Purpose and Need, Volume 2, December 14, 2005, p. VI-ii.
[51]/ *Ibid*., p. VI-5.
[52]/ *Ibid*., p. II-3.
[53]/ *Ibid*., p. VI-iv.

need for a 500/230 kV substation and has the advantage of completing a 500 kV loop through the Southern California load centers. The second sensitivity does require additional 500 kV transmission to reach Central substation."[54]

"A variation of the Full Loop is to incorporate the 500 kV transmission system associated with the planned LEAPS project which, as currently envisioned, would have a southern terminus at a new 500/230 kV substation somewhere along SDG&E's Talega-Escondido 230 kV line in northern San Diego County. It would have a northern terminus at a 500 kV switchyard somewhere along SCE's Serrano-Valley 500 kV line. A logical 'full loop' grid configuration would be to substitute the 500 kV transmission associated with the LEAPS project for most or all of the Central – Serrano/Valley portion of the Full Loop alternative. This configuration would eliminate the need for the LEAPS project's planned 500/230 kV substation on SDG&E's Talega-Escondido 230 kV line."[55]

SDG&E's analysis concluded that the "Full Loop" alternative "is consistent with the transmission additions that have been proposed in association with the Lake Elsinore Advanced Pumped Storage project"[56] and could, therefore, accommodate LEAPS and facilitate the transmission of pumped storage hydroelectricity.

To accommodate this alternative, the Applicant's proposed transmission alignment would need to be substantially expanded or modified to include a linkage with SDG&E's new Central East substation, located southeast of Lake Henshaw. Since this alternative cannot exist in the absence of the rerouting of the Applicant's transmission alignment and the implementation of the SRPL project, the potential environmental impacts of this alternative would be cumulatively greater than associated with the Applicant's Project.

As indicated by the Cities of Temecula, Hemet, and Murrieta, those cities "oppose the full loop alternative because it would almost certainly result in significant environmental and other impacts to their communities and residents. Because SDG&E's submittal lacks critical route information, it is impossible to discern the nature and extent of those impacts. It does appear, however, that the northern portion of the full loop alternative would cross through Southwest Riverside County. A similar transmission line was previously proposed and rejected in the Valley-Rainbow proceedings (A.01-03-036, filed March 23, 2001) after strong opposition from local residents. Because Riverside County is now even more populated and developed than it was during the Valley-Rainbow proceedings, construction of a transmission line through the area would be even less appropriate and feasible now."[57]

As indicated in the CPUC's and BLM's "Final Notice – CPUC/BLM Notice Regarding Conclusions on EIR/EIS Alternatives to the Proposed Sunrise Powerlink Project – Results of the Second Scoping Process": "Full Loop Alternatives would build a new 500 kV transmission line from the existing imperial Valley substation to either the proposed [SRPL] project's new Central East substation or to another new substation in northern

[54]/ *Ibid*., p. V-28.
[55]/ *Ibid*., p. VI-8.
[56]/ *Ibid*., p. VI-iii.
[57]/ Cities of Temecula, Hemet, and Murrieta (Shute, Mihaly & Weinberger), In the Matter of the Application of San Diego Gas & Electric Company for a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project, Protest of the Cities of Temecula, Hemet and Murrieta, January 17, 2006, p. 3.

San Diego County (e.g., Rainbow substation), then continue the new 500 kV line to a new substation in SCE's territory between the existing Serrano and Valley substations. Other partial implementation of the "full loop" alternatives recommended for elimination include: Imperial Valley-Ramona 500 kV; Imperial Valley-Rainbow 500 kV; and Imperial Valley-East of Escondido 500 kV. These alternatives do not pose an option to, but rather an expansion of the proposed [SRPL] project. By expanding the Sunrise Powerlink project to include a 500 kV link to Ramona, or further west, or an interconnection with the SCE system, these alternatives would enhance the proposed [SRPL] project's ability to meet reliability and import capability objectives. However, these alternatives would add to the impacts of the proposed [SRPL] project due to the additional construction and ROW required."[58] The CPUC and BLM further concluded that this alternative "would have environmental impacts as severe as those of the proposed [SRPL] project."[59]

The Applicant has considered the analysis presented by the CPUC and BLM in the "Final Notice – CPUC/BLM Notice Regarding Conclusions on EIR/EIS Alternatives to the Proposed Sunrise Powerlink Project – Results of the Second Scoping Process" and, relative to the Applicant's Project, concurs with those agencies' findings. The "Full Loop" would neither avoid nor substantially lessen the significant environmental effects attributable to the Project. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

- **"Antelope-Pardee 500 kV Transmission Project" Alternative**. On December 9, 2004, SCE filed an application requesting a CPCN to construct a new 500 kV transmission line connecting SCE's existing Antelope substation located in Lancaster (Los Angeles County) to SCE's existing Pardee substation located in Santa Clarita (Los Angeles County). As indicated in that project's documentation, "[t]he purpose for making application for the Antelope Transmission Project is derived from Ordering Paragraph No. 8 of Decision 04-06-010, which requires SCE to 'file an application seeking a certificate authorizing construction of the first phase of Tehachapi transmission upgrades [the Antelope Transmission Project] consistent with its 2003 conceptual study and the study group's recommendation within six months of the effective date of this order.' This order was premised on Finding of Fact No. 18, which described that the 'magnitude and concentration' of renewable resources identified in the California Energy Commission's Renewable Resource [Development] Report justified a 'first phase of Tehachapi transmission upgrades' to facilitating achievement of the Renewable Portfolio Standard goals."[60] The Antelope-Pardee 500 kV Transmission Project represents the first phase of a multiple segment project designed to access the wind energy potential that now exists within the Tehachapi area of Kern County.

  Once the connection to SCE's Vincent substation has been established, generated power can then flow through SCE's Vincent-Lugo, Lugo-Mira Loma, Mira Loma-Serrano, and

[58]/ California Public Utilities Commission and United States Department of the Interior – Bureau of Land Management, Final Notice – CPUC/BLM Notice Regarding Conclusions on EIR/EIS Alternatives to the Proposed Sunrise Powerlink Project – Results of the Second Scoping Process, March 16, 2007, p. 27.
[59]/ *Ibid*., p. 26
[60]/ California Public Utilities Commission and United States Forest Service, Draft Environmental Impact Report/Environmental Impact Statement – Antelope-Pardee 500 kV Transmission Project, July 2006, p. A-15.

Serrano-Valley transmission lines, thus allowing for a direct connection between Tehachapi and LEAPS but only following the implementation of the Applicant's Project.

All three phases of the Tehachapi transmission project were considered by the Applicant as a possible alternative. Also considered where the other alternatives examined in the CPUC/USFS' "Antelope-Pardee 500 kV Transmission Project Environmental Impact Report/Environmental Impact Statement" (Appendix 1 - Alternative Screening Report), inclusive of each of the design variation, alternative corridor, and other transmission alternatives and combination of alternatives considered therein.[61]

Because the Antelope-Pardee 500 kV Transmission Project neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources, implementation of this alternative would not allow for the attainment of the Project's primary goals and objectives. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

On January 24, 2007, the CAISO Board of Governors approved SCE's Tehachapi Transmission Project, consisting of a series of 17 new facilities or upgrades that will come on line over a period of five years, beginning in late 2008.

- **"Existing Valley-Serrano Transmission Corridor" Alternative**. As required under Section 1221(b) of the EPAct 2005, the Secretaries of Agriculture, Energy, and Interior and the Chairman of the Council on Environmental Quality were directed to prepare a report identifying: (1) all existing designated transmission and distribution corridors on federal land; (2) the status of work related to proposed transmission and distribution corridor designations under Title V of the Federal Land Policy and Management Act of 1976 (FLPMA) and any impediments to completing the work; (3) the number of pending applications to locate transmission facilities on federal land; and (4) the number of existing transmission and distribution rights-of-way on federal land that will come up for renewal within the next 5-year, 10-year, and 15-year periods and how those renewals will be managed.

  In compliance with that mandate, the United States Department of Agriculture (USDA), United States Department of the Interior, the DOE, and the Council on Environmental Quality (CEQ) prepared a "Report to Congress: Corridors and Rights-of-Way on Federal Lands." As reported by the Forest Service, in the general area, only SDG&E's existing 500 kV "Valley-Serrano" (identified as an "Existing Designated Transmission and Distribution Corridor"[62]) and the Applicant's 500 kV "Elsinore Valley Municipal Water District" (identifies as a "Pending Transmission Facility Application") were identified therein.[63] These federal designations only apply to existing or proposed projects located on federal reservations.

[61]/ California Public Utilities Commission and United States Forest Service (Aspen Environmental Group), Antelope-Pardee 500 kV Transmission Project Environmental Impact Report/Environmental Impact Statement, Appendix 1, Alternative Screening Report, May 2006, pp. Ap. 1-3 through Ap. 1-6.

[62]/ Defined as "[a]ll electric transmission line ROW corridors that have been formally designated by law, Secretarial order, land use planning process, or other management decision."

[63]/ United States Department of Agriculture, United States Department of the Interior, United States Department of Energy, and the Council on Environmental Quality, Report to Congress: Corridors and Rights-of-Way on Federal Lands, November 7, 2005, pp. 18 and 37.

Located with that "existing designated transmission and distribution corridor" is SCE's existing 500 kV Valley-Serrano transmission line. The SCE's existing "Valley-Serrano" transmission line traverses the Cleveland National Forest - Trabuco Ranger District (TRD) west of Lake Elsinore and connects SCE's Valley substation (Romoland, Riverside County) and Serrano substations (Orange, Orange County).

As part of the Applicant's FERC filing, the Applicant explored a transmission route that connected the Project's 500 kV transmission line to the "Existing Designated Transmission Distribution Corridor" in the area of Bald Peak. That routing option was eliminated based on the potential presence of sensitive biological resources near that point of interconnect and the inability of the Applicant to find a site suitable for a switchyard. As such, a connection located within the TRD was deemed infeasible.

The Valley-Serrano 500 kV transmission line represents that segment of SCE's existing 500 kV transmission system into which the northern 500 kV line segment of the Applicant's Project will connect. As such, this existing transmission line does not constitute a distinct alternative but an element of the existing project. Different points of junction between the Applicant's Project and SCE's Valley-Serrano transmission line may, however, exist and those alternative points of interconnect represent potential design variations for the Applicant's Project. An alternative point of interconnection with the existing Valley-Serrano transmission line is separately examined in "Alternative No. 5 (Alternative Lake Switchyard Site) herein.

The Applicant has considered the analysis presented in the SRPL proceedings (CPUC Docket No. A.06-08-010) and concurs that: (1) a "Valley-Serrano Transmission Corridor" alternative could be feasibly implemented based on siting constraints; and (2) the "Valley-Serrano Transmission Corridor" alternative does not have the potential to substantially reduce the Project's potential environmental effects. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

- **"Non-National Forest Route" Alternative**. The Applicant submitted and the USFS accepted for processing separate special use permit (SUP) applications for the Applicant's Project, including separate permits for the LEAPS and TE/VS Interconnect.[64] In accordance with Forest Service Handbook (FSH) 2709.11, the Applicant was required to explain the selection of the location of the proposed uses, state why the use of National Forest System (NFS) lands was necessary, and demonstrate why lands under non-federal jurisdiction could not be feasibly utilized.[65]

  As indicated in the FEIS, as jointly developed by FERC and the USFS: "Given the numerous constraints on locating transmission line corridors in the Lake Elsinore area, the USFS concluded during the application screening that National Forest System lands are necessary for the proposed interconnect. It is also evident that alternative locations

[64]/ Activities for which SUPs are authorized include: (1) systems and related facilities for generation, transmission, and distribution of electric energy (36 CFR 251.53[l][4]); and (2) such other necessary transportation or other systems or facilities which are in the public interest and which require rights-of-way over, upon, under, or through NFS lands (36 CFR 251.53[l][7]). The requested hydropower license can only be issued if the Commission determines that the proposed project is in or consistent with the public interest (16. U.S.C. 797[e]).

[65]/ As stipulated in FSM 2703.3(3), the Forest Service may deny proposals located on NFS land if the proposal "can reasonably be accommodated on non-National Forest System lands."

are not reasonably available to the co-applicants."[66] As such, the FEIS constitutes a declaration of the USFS' determination concerning the absence of a viable non-federal transmission alignment for the Applicant's Project. The Applicant concurs with FERC's and the USFS' independent conclusion that the Applicant's Project cannot be reasonably accommodated on non-NFS lands and that a non-NFS route is, therefore, not reasonably feasible.

A "freeway right-of-way" alternative was also considered. However, as indicated by the California Department of Transportation (Caltrans or Department): "Placement of longitudinal utility encroachments within freeway and expressway right-of-way is prohibited under Department policy."[67] The Federal Highway Administration (FHWA) has "delegated authority to Caltrans to approve public (utility companies regulated by the CPUC) utility longitudinal installations."[68] Based on the Caltrans-imposed prohibition, the ability of the Applicant to obtain FHWA and/or Caltrans authorization is considered speculative and is, therefore, deemed infeasible (14 CCR 15145).

6.2.3.3 "Alternative Advanced Transmission Technology" Alternatives

Under Section 1223 of the EPAct 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.[69]

On November 17, 2006, FERC declared: "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."[70]

One or more "advanced transmission technology" alternatives are examined in Section 6.2.3.1 ("Non-Wires" Alternatives) and Section 6.2.3.5 ("Alternative Electricity Storage Technology" Alternatives) herein. No further discussion of additional "Alternative Advanced Transmission Technology" alternatives is presented herein.

[66]/ *Op. Cit*., Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, FERC/EIS-0191F, p. A-1.
[67]/ California Department of Transportation, Encroachment Permits – Manual for Encroachment Permits on California State Highways, Seventh Edition, revised January 2002, p. 6-11.
[68]/ *Ibid.*, p. 6-12.
[69]/ Pub. L. No. 109-58, Section 1223, 119 Stat. 594, 953-54 (2005).
[70]/ Federal Energy Regulatory Commission, Order on Rate Request (Docket Nos. ER-06-278-000 *et al*.), issued November 17, 2006, p. 12.

6.2.3.4 "Alternative Hydropower Site" Alternatives

Although LEAPS is an exception, as illustrated in Figure 6.2-1 (Southern California Renewable Energy Resources),[71] within the southern California area, additional renewable energy will be predominately developed from wind and geothermal sources and not from new hydropower facilities. Nationally, the DOE predicts that "[a]lmost no new hydropower capacity is predicted through 2020"[72] and only 560 MW of conventional hydropower capacity is expected to be added to the nation's energy supplies by 2025.[73] 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."[74] Similarly, the CEC notes "[o]pportunities for construction of new hydroelectric plants and pumped storage projects are extremely limited in California."[75] This is particularly evident in southern California where only 20 MW of total installed hydroelectric capacity exists.[76] 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."[77]

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.[78] 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.[79] The lack of additional suitable sites inhibits the further application of this technology.[80]

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 three major river basins: American, Feather, and Stanislaus River basins. As illustrated in Figure 6.2-2 (Megawatts of Undeveloped Hydropower Potential in the California River Basins), the DOE has not identified any megawatts of undeveloped hydropower potential in the southern

[71]/ 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.
[72]/ Sale, M.J., *et al*., DOE Hydropower Program Annual Report for FY 2002, DOE/ID-1107, United States Department of Energy July 2003, p. 1; Sale, M.J., et al., DOE Hydropower Program Biennial Report for FY 2005-2006, ORNL/TM-2006/97, United States Department of Energy, July 2006, p. 1.
[73]/ Cada, Glen F., *et al*., DOE Hydropower Program Annual Report for 2003, DOE/NE-ID-11136, United States Department of Energy, February 2004, p. 1.
[74]/ 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.
[75]/ California Energy Commission, Integrated Energy Policy Report, CEC-100-2-5-007CMF, November 2005, p. 141.
[76]/ California Energy Commission, California Hydro-Electricity Outlook for 2002, Staff Report, P 700-02-004F, April 2002, p. 5.
[77]/ *Op. Cit*., Report on Reconnaissance Level Investigation of Lake Elsinore Pumped Storage Project, June 1990, p. 1-2.
[78]/ California Energy Commission, California Hydropower System: Energy and Environment, Append D – 2003 Environmental Performance Report, 100-03-018, October 2003, p. D-6.
[79]/ *Op. Cit*., Comparative Study of Transmission Alternatives: Background Report, 700-04-006, p. 13.
[80]/ Price, Anthony, Thijssen, Gerald, and Symons, Phil, Electricity Storage, A Solution in Network Operations?, October 12, 2000.

California coastal region.[81] Because of the limited potential for additional pumped storage and other hydropower facilities, with the exception of the Applicant's Project, it is unlikely that any substantial new regional hydropower capacity could be created.

Based on the absence of viable alternative hydropower (inclusive of both run-of-the-river and pumped storage) sites, the Applicant has determined that there exists no hydropower siting alternatives not involving the combination of surface waters within Lake Elsinore and the proximity of that lake to the Elsinore Mountains. As a result, the Applicant has concluded that alternative hydropower siting is not feasible. With regards to individual Project facilities, a number of possible design variations have been formulated and identified as alternatives herein.

6.2.3.5 "Alternative Electricity Storage Technology" Alternatives

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.[82]

As indicated in the "National Transmission Grid Study," electricity is not a commodity that can be easily stored.[83] In drawing an analogy, the study states: "Image 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."[84]

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."[85]

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, such as solar and wind power, which require backup sources of power and/or storage devices to store power for later use.[86] 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

[81]/ 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.
[82]/ Hirst, Eric and Kirby, Brendan, Transmission Planning for a Restructuring U.S. Electricity Industry, Edison Electric Institute, June 2001, p. 1.
[83]/ "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).
[84]/ United States Department of Energy, National Transmission Grid Study, May 2002, p. ii.
[85]/ Electric Power Research Institute, The Western States Power Crisis: Imperatives and Opportunities, An EPRI White Paper, June 24, 2001, pp. 18 and 45.
[86]/ International Atomic Energy Agency, Health and Environmental Impacts of Electricity Generation Systems: Procedures for Comparative Assessment, Technical Report Series No. 394, 1999, p. 47.

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, inertial, and SMES [superconducting magnetic energy storage] technologies covering a wide capacity range"[87]

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 gird because no cost-effective means exists for storing electricity."[88]

FERC, in an order dated November 17, 2006, held that the Applicant's Project met the requirements of Section 1223 of the EPAct 2005 and was, therefore, an "advanced transmission technology" that should be "encouraged, where appropriate."[89] Section 1223 of the EPAct 2005 defines "advanced transmission technology" as technology that increases the capacity, efficiency, or reliability of an existing transmission facility. The section includes a non-exclusive list of technologies covered under this definition, such as wireless power transmission, energy storage devices, and distributed generation.

The traditional function of energy storage devices is to save production costs by holding cheaply generated off-peak energy that can be 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.[90]

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.[91] Figure 6.2.2-3 (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.[92] As noted, wind turbine generation is not

[87]/ 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.
[88]/ 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.
[89]/ Federal Energy Regulatory Commission, Order on Rater Request, Docket Nos. ER06-278-000 *et al.*, Issued November 17, 2006, Paragraph 27.
[90]/ 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.
[91]/ 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).
[92]/ Hawkins, David, Wind Generation and Grid Operations: Experience and Perspective, California Independent System Operator, March 23, 2005.

coincident with demand.[93] In order 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."[94]

Alternating current 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), flow batteries, sodium sulfur batteries, lead-acid batteries, nickel-cadmium batteries, flywheels, electro-chemical capacitors, superconducting magnetic energy storage, and thermal storage.[95] With 38 plants, pumped storage is the "most popular large storage technology in the world with 19 gigawatts in the United States (2.7 percent of total generation).[96]

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."[97] Table 6.2-2 (Summary of the Development Status of Key Electricity Storage Devices) provides a general survey of the status of various energy storage technologies in the United States. As noted, few of these technologies, except for pumped hydropower and flywheels, are at a point where they are able to make significant contributions in transmission and distribution of electricity.[98]

Table 6.2-2 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 for grid 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

[93]/ 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).
[94]/ 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.
[95]/ Baxter, Richard, Energy Storage - A Nontechnical Guide, 2006, pp. 55-164.
[96]/ 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.
[97]/ 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.
[98]/ *Ibid*., p. 10.

One battery system that has shown potential promise for utility application is the vanadium redox flow batteries (VRBs). VRBs have been used in a number of demonstrations in small-scale utility-scale applications. As indicated by the EPRI: "The technical performance of vanadium redox 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 (5 to 10 MW) for relatively long duration (8 hours or longer). While no vanadium redox batteries have been built at these power levels so far, the experience with systems such as that at Tomamae would seem to indicate that there are few technical obstacles to building batteries of this size. A successful demonstration at the Donegal site will confirm this prediction."[99] The EPRI acknowledges that VRBs remain a developing and unproven large-scale technology undergoing limited and, as yet, incomplete demonstration.

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. Two generations of flywheels have produced increases in storage capacity through increased disk mass and increased rotation speeds; however, earlier generations of flywheels have technical limitations. New prototypes are utilizing magnetic levitation to increase speed and mass while minimizing previous technical issues. 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.[100]

As noted by the APS: "A conventional flywheel stores energy as the kinetic energy of a massive disk spinning on a metal shaft. The amount of energy stored depends upon the linear speed of rotation and the mass of the disk. First-generation flywheels, typically manufactured from steel, increased the mass while maintaining rim speeds on the order of 50 meters per second. The introduction of fiber-composite materials enables second-generation flywheels to reach speeds of 800-1000 m/s. These higher-speed machines are limited by the expansion of the rim, which can be as much as 1-2% at high speeds. The expanding rim separates from the rest of the flywheel. They also experience bending resonances and other dynamical instabilities. Third-generation flywheels, currently under development, combine high mass with high rotational speed to maximize overall energy storage. One system utilizes levitated ring design that resolves many of the design flaws in first- and second-generation flywheels. Using a ring as the rotator eliminates the expansion failure. In addition, the magnetic field can be adjusted to control the rotational instability failure. In addition, the magnetic fields can be adjusted to control the rotational instabilities that arise at high speeds. These systems currently exist as prototypes only. Short discharge time flywheels are suitable for stabilizing voltage and frequency, while longer duration flywheels may be suitable for damping load fluctuations. However, the high cost and limited capacity of first- and second-generation flywheels has greatly limited the implementation of this technology. A flywheel farm approach could be advantageous for larger-scale energy storage.

[99]/ Electric Power Research Institute, Vanadium Redox Flow Batteries – An In-Depth Analysis, Technical Update, March 2007, p. 5-2.
[100]/ 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)

Current technology could allow forty 25 kW flywheels to operate at 1 MW for 1 hour in one facility."[101]

Presently, flywheels are neither technologically nor economically feasible on a scale sufficient to provide energy storage capacity comparable to that of LEAPS.

An "alternative storage technology" alternative would neither improve transmission access to the location-constrained LEAPS area nor allow for the achievement of a preponderance of the Project's objectives, including the Project's engineering parameters. In addition, technological limitations and lack of commercial application limit the consideration of other energy storage devices. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

6.2.3.6 "Generation-Interconnection" Alternatives

With regards to the point of juncture for the Applicant's Project, a number of options were identified, including: (1) a single point of connection via a transmission line extending northward from the LEAPS powerhouse to a new substation located along the SCE's 500 kV Valley-Serrano transmission line; (2) a single point of connection via a transmission line extending southward from the LEAPS powerhouse to a new substation located along the SDG&E's 230 kV Talega-Escondido transmission line; or (3) two points of connection, one extending northward to a new substation located along the SCE's Valley-Serrano transmission line and one extending southward to a new substation located along the SDG&E's Talega-Escondido transmission line.

The possible integration of the northern and the southern segments of the proposed 500 kV transmission line into a single, consolidated project was identified in the Applicant's FERC-filed "Initial Stage Consultation Document. As indicated therein: "If constructed concurrently, the two high-voltage transmission lines would appear as a single, integrated 500 kV conduit linking SCE's Valley-Serrano line in Riverside County to SDG&E's Talega-Escondido line in San Diego County. The combined high-voltage transmission line could possibly serve as an alternative to and functional equivalent of SDG&E's Valley-Rainbow Interconnect Project."[102] The combined northern and southern segments (identified herein as the TE/VS Interconnect) were identified by the CPUC/BLM as part of its alternative analysis for the Valley-Rainbow interconnect project.

The "San Diego Energy Infrastructure Study," as prepared by the San Diego Association of Governments (SANDAG), concluded: "Transmission capacity and import capability become important over the 2004-2010 time period. To avoid near-term imbalances the region needs 1 to 2 new generation plants, additional transmission, and increased energy efficiency. If these resources are not available, higher prices and load curtailments may occur. Unless the [San Diego] region pursues a strategy of diversifying its electric supply portfolio, including energy efficiency, demand response, distributed generation, renewables and additional transmission, the ability of the region to meet its needs in the longer-term will become increasingly difficult,

[101]/ *Ibid*., pp. 13-14.
[102]/ Elsinore Valley Municipal Water District and The Nevada Hydro Company, Inc., Initial Stage Consultation Document – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, April 2001, p. 66.

particularly in the outer years."[103] SANDAG has stated that, without a project like Valley-Rainbow, "the generation development in these areas may for all practical purposes be limited to about 1,000 to 1,400 MWs due to congestion constraints going north from SDG&E. An outage of the single connection to SONGS can leave SDG&E with a serious power shortage, such as that which occurred on February 27, 2002. If the Valley Rainbow interconnect project had been in operation at the time of this event, it would have prevented the need for firm load shedding of some 211,000 customers (approximately 300 MW) in SDG&E's service area."[104,]

With regards to either a single northern or southern point of juncture between LEAPS and the CAISO-controlled grid, as indicated by FERC: "SDGE needs additional in-area generation resources. Therefore, the southern route is the indicated choice. However, the maximum benefit to both the CAISO and SDGE would be derived from completing the total connection between the TE and VS transmission lines. The second connection would also add" other benefits, including reliability, reduced congestion, and improved access.[105]

As proposed, assuming the construction of both the northern (Lake-Santa Rosa) and the southern (Santa Rosa-Case Springs) segments, the Applicant's Project would provide substantial reliability benefits to the San Diego area, provide additional import capacity into the San Diego area, and provide a path for the importation of Tehachapi wind renewable energy. Conversely, by eliminating the Applicant's southern line segment (Santa Rosa-Case Springs), the LEAPS project would not benefit the San Diego area. Similarly, by eliminating the northern line segment (Lake-Santa Rosa), the Applicant's Project would not serve to provide a regional renewable resource benefit. If only the northern (Lake-Santa Rosa) or southern (Santa Rosa-Case Springs) half of the transmission line were to be constructed, the reduced-scale option would not meet the preponderance of the Project's objectives. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

[103]/ County of San Diego, San Diego Regional Energy Office, City of San Diego, Utility Consumers Action Network, San Diego County Water Authority, San Diego Association of Governments, and Ports of San Diego (Science Applications International Corp.), San Diego Energy Infrastructure Study, December 30, 2002, p. 4-1.
[104]/ *Ibid*., p. 4-17.
[105]/ *Op. Cit*., Final Environmental Impact Statement Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, FERC/EIS-0191F, p. B-21.

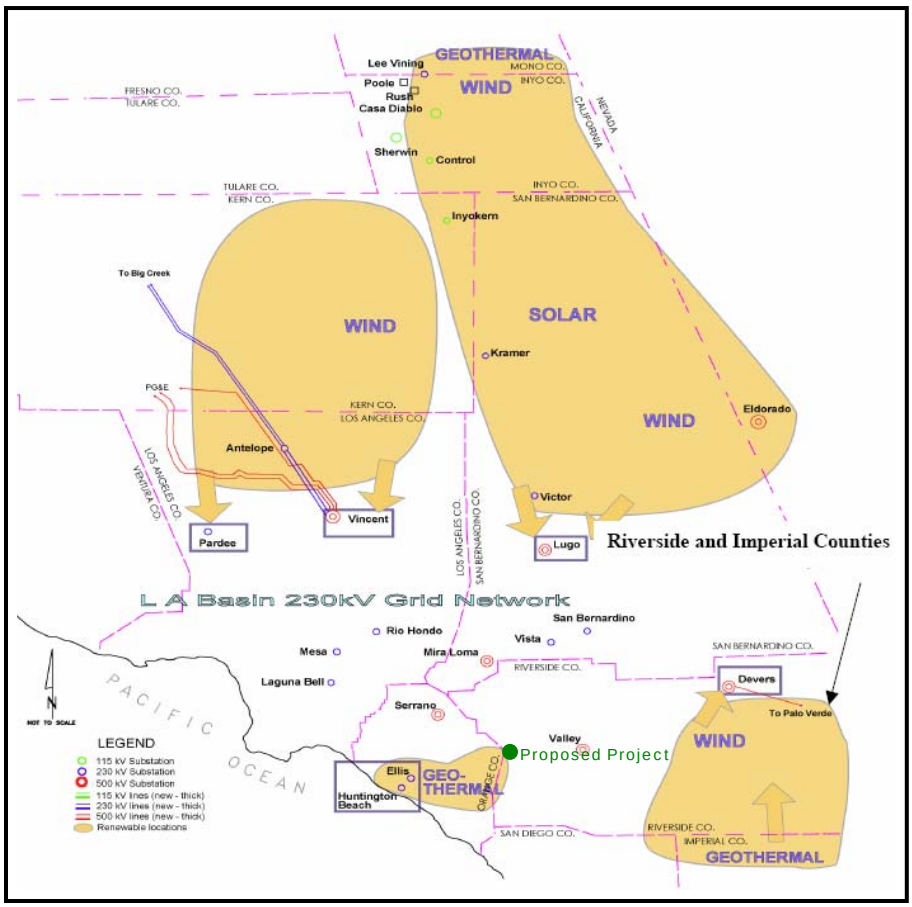


Figure 6.2-1 Southern California Renewable Energy Resources
Source: California Public Utilities Commission

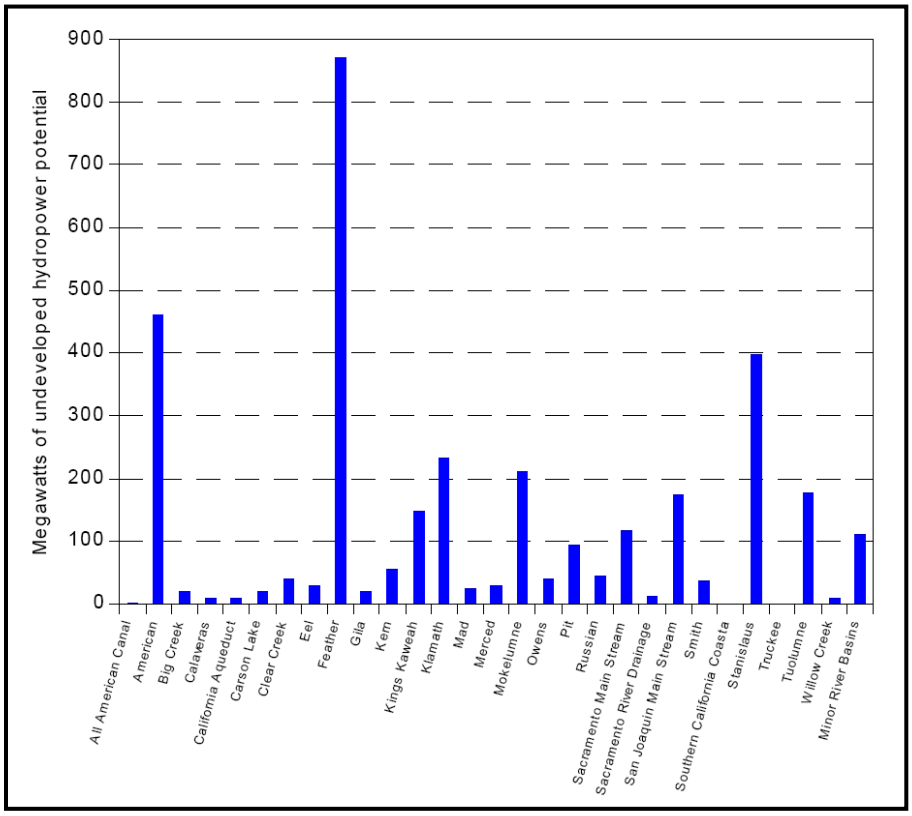


Figure 6.2-2 Megawatts of Undeveloped Hydropower Potential in the California River Basins
Source: United StatesDepartment of Energy

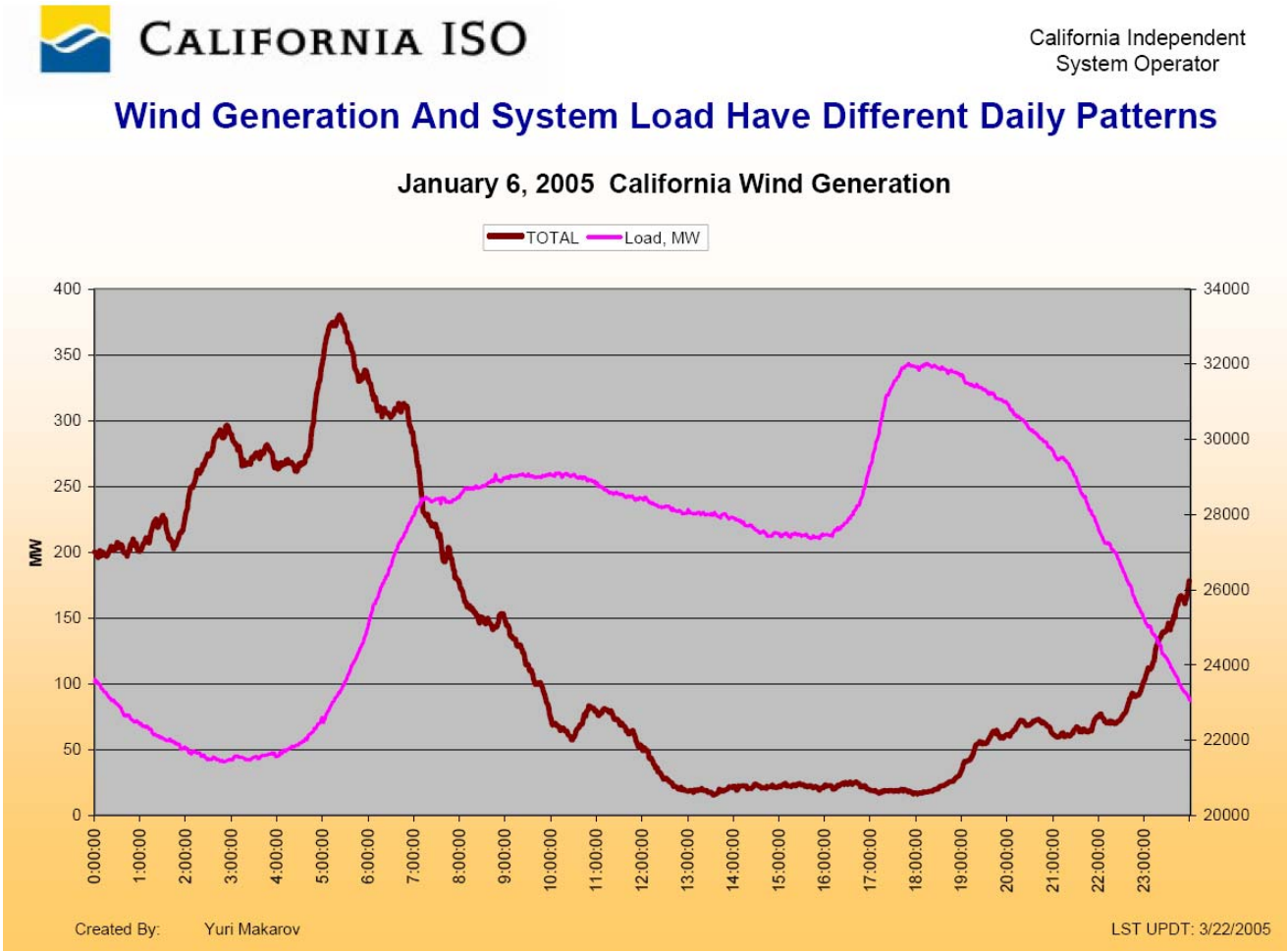


Figure 6.2-3 Wind Generation and System Load Have Different Daily Patterns
Source: California Independent System Operator

6.2.3.7 "Alternative Hydropower Facility" Alternatives

The Applicant considered the following additional hydroelectric facility alternatives.

- **"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 Project. Multiple small-generator projects would likely increase the impacts associated with a single, albeit, larger project. A small hydro project was considered and rejected 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 Project's environmental effects.

- **"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.[106]

  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. In recognition of the speculative nature of any contractual agreements, the Applicant concluded that this alternative was not feasible.

[106]/ 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.

- **"300/330 MW Advanced Pumped Storage" Alternative**. As indicated in the Elsinore Valley Municipal Water District's (EVMWD) 1994 preliminary permit (FERC Project No. 11504), a 300 MW FERC-licensed advanced pumped storage facility was previously proposed. As indicated in the EVMWD's 2000 preliminary permit application, the previous proposal was initially identified as comprising "three pump/turbines [which] would be of the vertical, reversible Francis type, rated to produce 110 to 167 MW at the minimum operating head."[107]

  On October 21, 2000, Voith Siemens Hydro, Inc. (VSH) completed an in-depth study of three alternatives plant sizes. The intent of those studies was to optimize the turbine generator selections, current utility rates, cost equipment utilization, and interconnect voltages. Of the options examined by VSH, a 500 MW facility was found to be the best selection for a 230/500 kV interconnection to the existing SDG&E and SCE system.

  Construction of a 300/330 MW pumped storage facility would incorporate the same general features as associated with the Applicant's Project, including a new upper reservoir, powerhouse, transmission lines, and substations. Other than the size and the efficiency of the reversible turbines, the construction-related and the operational impacts would be virtually identical to those associated with LEAPS, including the need for similar mitigation measures. The electrical and ancillary benefits of the Applicant's Project would, however, be reduced if the generation capacity were itself reduced, as would the Project's ability to both serve electricity needs of the San Diego area and facilitate the attainment of the State's RPS goals.

  A 300/330 MW hydropower project would not reasonably be expected to substantively reduce or avoid any of the proposed project's environmental effects. Although the environmental impacts would be virtually identical, the corresponding energy system benefits of a reduced-output project would be reduced and would predicate the need for one or more additional projects to replace those forfeited benefits. Absent an economic analysis, it is uncertain whether a reduced-output project would remain economically viable. Although this alternative would allow for the attainment of a number of the Project's objectives, the Applicant has concluded that the further consideration of this option would not satisfy the CEQA obligation to foster informed decisionmaking (14 CCR 15126.6[a] and [f]).

- **"1,000 MW Advanced Pumped Storage Hydropower" Alternative**. As now proposed, the Applicant's Project involves a single approximately 100-acre upper reservoir (Decker Canyon) and the use of two 250 MW Francis-type reversible turbines. Although no power flow studies have been performed, none of the studies conducted by or for the Applicant have demonstrated the lack of feasibility of constructing either a larger single reservoir or two upper reservoirs (Decker Canyon and Morrell Canyon) and installing either additional turbines or increasing the output of the turbines to be installed.

  The State CEQA Guidelines limits the investigation of reasonable alternatives to those that could feasibly accomplish most of the basic objectives of the project and avoid or

[107]/ Elsinore Valley Municipal Water District, Application for Preliminary Permit – Lake Elsinore Advanced Pumped Storage Project, September 15, 2000, p. 1-3.

substantially lessen one or more of the significant impacts (14 CCR 15126.6[c]). It can be reasonably concluded that, based on the larger development footprint and the additional construction impacts associated with developing a larger-output project, this alternative's impacts would be greater than those associated with a 500 MW hydropower pumped storage facility. Since the impacts of a larger hydropower project would not likely be less that those associated with the Applicant's Project, the Applicant has eliminated this alternative not because of its inability to satisfy the Project's basic objectives but because it does not satisfy the impact-avoidance intent of the State CEQA Guidelines.

- **"Other Hydropower" Alternatives**. A run-of-the-river (ROR) hydropower project alternative was eliminated because, in the general area, there does not exist a river or other water body of sufficient size or containing year-round flows conducive to the development of this type of facility.

  On December 21, 2007, the Director of the United States Department of the Interior, Minerals Management Service (MMS) signed the "Record of Decision" for the "Final Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternative Use of Facilities on the Outer Continental Shelf."[108] Technologies examined included wind turbines, wave energy (point absorbers, attenuators, overtopping devices, and terminators), and ocean currents (tidal energy).

  The MMS selected the preferred alternative, establishing an alternative energy and alternative use (AEAU) program for the issuance of leases, easements, and rights-of-way on the Outer Continental Shelf (OCS) for alternative energy activities and the alternative use of structures on the OCS. Selection of the preferred project also provided the MMS the option to authorize, on a case-by-case basis, individual AEAU projects that are in the national interest prior to the promulgation of the final rule.

  Each of those alternatives were considered but subsequently eliminated by the Applicant based on the limited application of those technologies, the absence of suitable lands or waters in the general area, the speculative nature of the Applicant's ability to obtain permits from the California Coastal Commission and the Federal Marine Fisheries Service, and the absence of current environmental information upon which an alternative analysis of those technologies could be reasonably based.[109]

6.2.3.8 "Alternative Generation" Alternatives

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

[108]/ United States Department of the Interior, Minerals Management Service, Final Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternative Use of Facilities on the Outer Continental Shelf, OCS EIS/EA MMS 2007-046, October 2007.

[109]/ The Minerals Management Service (MMS), a bureau of the United States Department of the Interior, has conducted initial scoping meetings in advance of the preparation of a "Outer Continental Shelf Renewable Energy and Alternative Use Programmatic Environmental Impact Statement." The programmatic EIS will evaluate the issues associated with renewable energy development in federal waters of the Outer Continental Shelf (OCS).

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 a one and a half percent, firm load will likely be shed locally, resulting in rotating blackouts in order to avoid system-wide blackouts.

As opposed to baseload power plants that operate continuously, peaking power plants (peaker) generally only run when demand is high. Peaker plants are generally gas turbines that burn natural gas. Although gas turbine plants dominate the peaker plant category, other plants, including pumped storage facilities, may provide power on a peaking 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."[110] The Applicant considered and eliminated from further consideration other types of peakers, such as natural-gas fired combustion-turbine generators.

Since an "alternative transmission technology" alternative would not improve transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources, implementation of this alternative would not allow for the attainment of the Project's primary goals and objectives. As a result, the Applicant does not suggest that this alternative be brought forward by the CPUC for comparable review.

6.2.3.9 "Design and Development Variation" Alternatives

The results of detailed design and engineering studies were presented in the Applicant's "Final License Application"[111] (FLA). In addition to those 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 (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) and configuration variations; (2) reservoir liner system variations (e.g., clay, asphaltic concrete, geo-membrane, and combination liner systems); (3) penstock alignments and configuration variations; and (4) transmission tower design (e.g., guyed, V-shaped structure, guyed, delta structure, four-legged, self-supporting structure, and H-Frame, tubular-steel structure) and configuration variations.

With regards to proposed 500 kV transmission alignment, the ROW is primarily on federal lands located within the TRD and is subject to FERC licensing and a USFS SUP. As identified in the FEIS, FERC and the USFS have identified a preferred alignment (identified in the FEIS as the "staff alternative"). As a result, on NFS lands, the Applicant has eliminated all substantially different 500 kV transmission alignments associated with the Applicant's Project.

[110]/ *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.
[111]/ Elsinore Valley Municipal Water District and The Nevada Hydro Company, Inc., Final Application for License of Major Unconstructed Project, Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, November 2004.

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 where identified in the Elsinore Mountains (Decker Canyon and Morrell Canyon). Based on environmental consideration, Decker Canyon was identified by FERC and by the Forest Service as the preferred location for that facility. As such, based on requisite USFS permitting requirements and stipulations, the Applicant has eliminated Morrell Canyon from further consideration.

Alternatives considered under CEQA relate to the project as a whole. As such, the CEQA Lead Agency is not required to analyze specific alternatives to those separate parts that do not foster meaningful decisionmaking (Big Rock Mesas Property Owners Association v. Board of Supervisors). 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.

6.2.3.10"Concurrent vs. Sequential Construction" Alternatives

The Project's schedule assumes that the transmission component would be constructed prior to the construction of the generation (pumped storage) component The sequential construction of Project facilities is the result of a number of factors including, but not limited to: (1) increased engineering complexity associated with the generation (pumped storage) facility as compared to the transmission facility; (2) the benefits to the regional transmission grid that early energization of the interconnection will provide the State and the region; (3) the ability of permitting agencies to bifurcate the Project's transmission and generation (pumped storage) components from a permitting perspective; and (4) the ability to entitle, finance, and physically construct the transmission component in advance of the generation (pumped storage) component.

The Applicant, however, retains the option to construct the generation and transmission facilities either concurrently or sequentially, subject to receipt of appropriate permits and approvals. The Applicant has rejected, as a distinct alternative, any options wherein various development and staging sequences are examined as separate alternatives.

6.2.4 Alternatives under Consideration

With the exception of the "no project/no build" alternative, each of the following development (build) alternatives satisfies, in whole or in part, the stated objectives for the Applicant's Project. The comparative environmental impacts associated with each of the following alternatives is examined in the FEIS.

6.2.4.1 Alternative No. 1 - "LEAPS Only"

The identification of LEAPS as an "alternative" herein is presented for informational purposes only. LEAPS is not specifically an alternative to the Applicant's Project but is one of the two principal components of the proposed action addressed herein.

Since the subsequent actions of FERC and any associated federal entitlements regarding the Applicant's Project cannot be predetermined and remain subject to the discretionary actions of that federal agency, from a CEQA perspective and with regards to the formulation of alternatives, the following possible FERC-licensed scenarios were identified.

- **Short-tap generation-interconnection**. Under the first scenario, the TE/VS Interconnect and LEAPS are fully entitled by FERC and include both a new 500 MW generation (pumped storage) facility and a new FERC-licensed transmission facility allowing for 1,100 MW of additional import capacity into the San Diego region. The Lake-Case Springs transmission line provides a network connection between SCE's 500 kV Valley-Serrano transmission line and SDG&E's 230 kV Talega-Escondido transmission line and links those network upgrades to the hydropower facility via a new short-tap generation-intertie (gen-tie) extending from the Santa Rosa substation to the point of interconnection with the new Lake-Case Springs transmission line. Under this scenario, the new 500 kV Lake-Santa Rosa-Case Springs and the improved 230 kV Talega-Case Springs-Escondido transmission lines are network upgrades.

- **Lake-Case Springs generation interconnection**. Under the second scenario, the LEAPS facilities are constructed but the associated transmission facilities are sized to serve as primary lines (1,500 MW rating). Under this scenario, the primary differences between this alternative and the Applicant's Project relates to FERC's licensing and line designation, the sizing and capacity of the TE/VS Interconnect (including minor design variations relative to conductors and insulators on the transmission towers), the placement and sizing of individual substation components, and design variations within the proposed substations themselves. Under this scenario, the improved 230 kV Talega-Case Springs/Case Springs-Escondido transmission line is a network upgrade but the new 500 kV Lake-Santa Rosa-Case Springs transmission line is a gen-tie.

From an environmental impact perspective alone, although existing system upgrades would be somewhat reduced, these differences are not substantial because the physical changes to the existing environmental setting would generally be the same under either scenario. As a result, the impacts attributable to a "LEAPS only" alternative would not be expected to be substantially different from those associated with the Applicant's Project.

The potential environmental impacts of a "LEAPS only" alternative are as outlined in Section 5.0 (Environmental Impact Assessment Summary) and Section 6.0 (Detailed Discussion of Environmental Impacts) herein.

6.2.4.2 Alternative No. 2 - "TE/VS Interconnect Only"

The identification of TE/VS Interconnect as an "alternative" herein is presented for informational purposes only. TE/VS Interconnect is not specifically an alternative to the Applicant's Project but is one of the two principal components of the proposed action addressed herein.

Since the subsequent actions of State and federal regulators cannot be predetermined and remain subject to the discretionary actions of those agencies with jurisdiction over the Project, from a CEQA perspective and with regards to the formulation of project alternatives, the following possible scenarios were identified: (1) the 500 MW pumped storage component is not licensed by FERC and/or permitted by the USFS and is, therefore, not constructed; and (2) notwithstanding the Applicant's receipt of a federal hydropower license and the requisite SUPs from the Forest Service, the 500 MW pumped storage component is not constructed based on the Applicant's inability to secure necessary financing or other factors preventing its

implementation; and (3) the federal license expires based on the Applicant's inactivity or inability to proceed with the timely construction of the hydropower facilities.

Although LEAPS (including the proposed powerhouse, upper reservoir, penstocks, and intake/outlet structures and such other related improvements and facilities as may be associated therewith) is not construction, under each of those scenarios, the following facilities are constructed and energized: (1) the new Lake-Case Springs transmission lines, including all associated switchyard, substations, and appurtenant facilities; (2) improvements to SCE's Valley-Serrano system, including SCE's proposed new substation; and (3) improvements associated with the 230 kV Talega-Escondido system, including all appurtenant facilities.

With regards to those transmission lines and associated upgrades, two possible design variations were considered under this alternative: (1) assuming that TE/VS Interconnect is a precursor to LEAPS, the transmission lines and related facilities are sized to accommodate both the power flows associated with the SCE/SDG&E interconnection and the additional electricity required for the 600 MW of pumping and the 500 MW of generation (pumped storage) associated with the hydropower component (1,100 MW path rating); or (2) assuming that TE/VS Interconnect is not a precursor to LEAPS or can be constructed in such a fashion as to phase the installation of such additional improvements as may be required to accommodate the additional power flows associated with the hydropower facility, the transmission lines and related facilities would only be initially sized to accommodate the power flows attributable to the TE/VS Interconnect and not the additional capacity required for the pumping and generation associated with the pumped storage facility (1,100 MW rating). The primary differences between these variations relate to the rating of the transmission lines, including any resulting design variations relative to conductors and insulators on the transmission towers and design variations within the Lake switchyard and Case Springs substation.

If the construction of the transmission lines were phased such as to include two distinct construction phases, construction impacts would occur at two distinct occasions rather than just once. Although they would occur over a longer duration, the impacts that would likely manifest during the second construction sequence would not be expected to exceed those likely to exist during the initial construction. From an impact perspective, two construction phases would extend the overall construction time but may not substantively increase the significance of the impacts predicted to occur during the Project's construction activities.

Because CEQA is to "be interpreted in such a manner as to afford the fullest possible protection to the environment" (14 CCR 15003[f]), for the purpose of CEQA analysis, it should be assumed that the transmission lines are designed, sized, constructed, and improved to accommodate both interconnection and generation functions. Under this variation, for the purpose of this CEQA analysis, the Lake-Case Springs transmission lines would have a 1,100 MW path rating. The resulting new 500 kV transmission line (Lake-Case Springs), the new switchyard and substations, and the SDG&E upgrades (Talega-Escondido No. 2), including all appurtenant facilities, constitute network upgrades. This scenario allows for the consideration of a "transmission only" alternative.

The potential environmental impacts of this "TE/VS Interconnect only" alternative are as outlined in Section 5.0 (Environmental Impact Assessment Summary) and Section 6.0 (Detailed Discussion of Environmental Impacts) herein.

6.2.4.3 "Alternative Facility Siting" Alternatives

For consistency, except where otherwise modified, the Applicant's Project, as identified and described in this PEA, constitutes the "staff alternative" as described in the FEIS. For a number of facility components, however, one or more locational variations have been identified whereby a specific Project-related facility might be constructed in a different location. None of the retained variations described herein result in a functional change in the engineering characteristics of the Applicant's Project.

The following facility siting variations constitute development options that the Applicant seeks to retain in the upcoming CEQA documentation and constitute possible alternatives to the location and placement of certain facilities described in Section 3.0 (Project Description).

- **Alternative No. 3 - "Alternative LEAPS Powerhouse/Substation Site."** This alternative is proposed because it represents one of only two possible locations where the proposed LEAPS powerhouse could be feasibly constructed.

  As indicated in the Applicant's FLA, three possible LEAPS powerhouse sites were identified. The names used for the purpose of identifying these powerhouse sites (Ortega Oaks, Santa Rosa, Evergreen) related to proximal streets or other local landmarks. The Santa Rosa powerhouse site was identified in the FLA as the Applicant's "preferred project" based, in part, on its relationship to the Applicant's preferred Morrell Canyon reservoir site. Although the Ortega Oaks powerhouse site was better aligned with the Decker Canyon upper reservoir site, the FEIS identified the Santa Rosa powerhouse and the Decker Canyon upper reservoir sites as FERC's and the Forest Service's "staff alterative."

  Of the two alternative powerhouse sites (Ortega Oaks and Evergreen), only the Ortega Oaks site has been retained as an alternative. Because the distance between the Decker Canyon upper reservoir site and the previously identified Evergreen powerhouse site would substantially increase tunneling costs, the Applicant has elected not to retain the Evergreen powerhouse site herein. The decision not to carry forward the discussion of the Evergreen powerhouse site is the result of a preliminary economic analysis conducted by the Applicant and is not itself indicative of the presence of environmental constraints that would preclude the possible development of that property.

  As depicted in Figure 6.2-4 (Alternative Ortega Oaks Powerhouse and Substation Site), the alternative LEAPS powerhouse and substation site abuts SR-74 (Ortega Highway) and is primarily undeveloped. The southern portion of the property is used by hang gliders as a landing zone for flights emanating from within the CNF. Single-family residential uses and a Riverside County flood control facility abut the property to the east. Existing commercial uses, including Ortega Oaks Market (15887 Grand Avenue, Lake Elsinore) and Ortega Oaks Plaza (15887 Grand Avenue, Lake Elsinore), abuts the property to the south. Rural residential uses and a religious facility (Mountainside Ministries [30515 Ortega Highway, Lake Elsinore]) are located to the south of Ortega Highway. North of Grand Avenue, single-family uses and vacant buildings comprising the site of the former Elsinore Country Club and Elsinore Naval Academy (15900 Grand Avenue, Lake Elsinore) are located adjacent to the area of the alternative inlet/outlet

structure. The alternative powerhouse/substation sites and the alternative inlet/out structure are located in the unincorporated Lakeland Village area of Riverside County.

Elevations range from a maximum of 1480 feet AMSL at the extreme southerly point of the site to a minimum of approximately 1340 feet AMSL along the northerly site boundary. Topographically, the alternative powerhouse and substation site comprises a portion of a relatively broad alluvial fan that is transected by small erosion gullies. Drainage is to the north towards Lake Elsinore. On-site vegetation comprises a mix of Riversidian sage scrub and non-native grasses. Some of the more readily identifiable trees and plants included a single live oak, numerous olive and pepper trees, buckwheat, chamise, white sage, sumac, wild tobacco, coyote gourd, and foxtails.

The alternative Ortega Oaks powerhouse and substation site is privately owned[112] and, although located within the Congressional boundaries of the CNF, is not administered by the USFS. The powerhouse site is about 60 acre in size and is bordered on the north and east by the City of Lake Elsinore. The site is presently vacant but is used by the Elsinore Hang Gliding Association (EHGA), operating under a USFS-issued SUP,[113] as a hang gliding landing site.[114] If constructed on the Ortega Oaks powerhouse site, the powerhouse would be located about 340 feet underground, at about 1050 feet AMSL, and about 1,950 feet from Lake Elsinore. The powerhouse/substation designs would generally be as described for the Santa Rosa powerhouse and substation.

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the Applicant's Project.

◊ **Aesthetics**. The visual resource impacts of this alternative would be generally comparable to those associated with the Santa Rosa powerhouse site. Because the Ortega Oaks powerhouse site has greater visibility and abuts Ortega Highway, construction-term impacts would likely be more pronounced. Once operation, the greater visibility of the site would result in beneficial aesthetic impacts based on the limited nature of above ground improvements, the proposed landscaping, and the incorporation of a publicly accessible neighborhood park abutting that State Highway.

◊ **Agricultural Resources**. Since neither the Ortega Oaks nor the Santa Rosa powerhouse sites are presently used for any agricultural or farm-related use, the impacts on agricultural resources would be generally comparable.

◊ **Air Quality**. The quantity of construction-term and operational criteria emissions would not be expected to differ substantially between the two alternative powerhouse sites. However, because the Ortega Oaks powerhouse site is located

[112]/ On April 20, 2004, the Riverside County Board of Supervisors approved final Tract Map Nos. 22626 and 22626-1 (Board of Supervisors Agenda Item Nos. 2.15 and 2.16), subdividing the proposed Ortega Oaks powerhouse site into approximately 133 single-family residential lots. In the event that residential development were to occur on that site, it is likely that powerhouse development of that property would be deemed to be infeasible and an alternative powerhouse site would need to be selected.

[113]/ Authorization ID: TRD05805; Contact ID: TRD0303.

[114]/ The use of the proposed Ortega Oaks powerhouse site by the Elsinore Hang Gliding Association is the subject of two ongoing lawsuits before the Riverside County Superior Court (Elsinore Hang Gliding Association v. Western International Development, LLC, Kang Shen Chen, CKS Concordia Development, L.L.C. [Case RIC411343] and Western International Development, LLC, Kang Shen Chen, CKS Concordia Development, L.L.C. v. Elsinore Hang Gliding Association [Case RIC455494]). The current status of that litigation is unknown.

in closer proximity to a larger number of residential receptors, construction-related air quality impacts on those residences, both in terms of fugitive dust and toxic air contaminants, would be expected to be greater.

◊ **Biological Resources**. Although possessing remnants of Riversidean sage scrub (RSS), the Ortega Oaks powerhouse site has been predominately cleared of most native vegetation and is routinely maintained for weed abatement purposes. Conversely, the Santa Rosa powerhouse site is generally undisturbed, containing a predominant RSS scrub plant community. As a result, selection of the Ortega Oaks powerhouse site would result in an incremental reduction in the acreage of disturbance to that plant community. RSS is not, however, categorized as a plant community that is "known or believed to be of high priority for inventory" in the California Natural Diversity Database (CNDDB)[115] and this habitat type is not categorized as a "rare natural community."[116]

◊ **Cultural Resources**. Two archaeological sites have been identified in the area of the Santa Rosa powerhouse site, including one prehistoric site (RIV-5878[117]) and two historic site (RIV-5877H[118] and RIV-7658H[119]). Field reconnaissance surveys of the Ortega Oaks powerhouse site have been negative and no prehistoric or historic resources have been encountered on that property. Ground-borne vibration from construction could potentially affect a number of historic-period buildings (33-7177 and 33-7221) adjacent to the Santa Rosa powerhouse site.

◊ **Geology and Soils**.[120] Both the Santa Rosa and Ortega Oaks powerhouse sites are feasible from a geotechnical perspective. Based on the geophysical survey results and geologic mapping, competent bedrock will be encountered at the required depths at both sites. The depth to bedrock at the Ortega Oaks powerhouse site is estimated to range from 110-160 feet below ground surface. Depth to bedrock at the Santa Rosa site is estimated to range form 70-145 feet below ground surface.

For the Ortega Oaks site, construction access to the powerhouse may require significant excavation in the overburden soils. At the Ortega Oaks site, a shaft-

[115]/ California Department of Fish and Game, The Vegetation Classification and Mapping Program List of California Terrestrial Natural Communities Recognized by The California Natural Diversity Database, September 2003 Edition.

[116]/ California Department of Fish and Game, Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities, December 9, 1984, Revised May 8, 2000.

[117]/ RIV-5878 comprises a bedrock milling station situated adjacent to a small building pad located midway along the eastern margin of the site. The building pad comprises the only vestiges of a dwelling that was demolished in the mid 1960's in connection with the Cox Mine eviction. The single, elongated granitic boulder bears one milling slick and one starter mortar. No obvious signs of a subsurface deposit were observed at this location.

[118]/ RIV-5877H consists of the ruins of a dwelling, most likely that of a cabin or small house located adjacent to a dirt road approximately 700 feet northwest of RIV-5878. The only visible remains of the structure itself comprise a small concrete cellar. It is rectangular in plan and measures 8 feet by 11 feet with a depth of approximately 6 feet. A four-step staircase leads into the cellar from the northern elevation. The age of the ruin is unknown although it may have been contemporaneous with the dwelling demolished in conjunction with the Cox Mine eviction. The location of the ruin is illustrated on the 1942 Lake Elsinore 15-Minute United States Army War Department map (Corps of Engineers, U. S. Army Grid Zone G).

[119]/ RIV-7658H is described as consisting of the wall and foundation remnants of a historic and semi-subterranean building located along an ephemeral drainage on the north-facing slope north of the Elsinore Mountains and south of Lake Elsinore.

[120]/ A comparative analysis of the two powerhouse sites is included in "Comparative Review of Geotechnical Conditions at Three Candidate Powerhouse Sites: Ortega Oaks, Santa Rosa and Evergreen, Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858" (GENTERRA Consultants, Inc., March 24, 2006), submitted to the Commission in response to the Commission's release of the "Draft Environmental Impact Statement – Lake Elsinore Advanced Pumped Storage Project, California, FERC Project No. 11858," incorporated by reference herein.

type of powerhouse may be the most feasible method of construction since the overburden soils will require a shoring system, which could be incorporated into the permanent support system for the shaft. For the Santa Rosa site, an underground cavern- or shaft-type of powerhouse is being considered because of the proximity of bedrock to the ground surface.

◊ **Hazards and Hazardous Materials**. The quantity of hazardous materials that may be on the Project's facility sites during construction would be minimal and, with the possible exception of explosive material, would not be expended to differ substantially between the two sites. Based on preliminary geotechnical information, grading activities at the Santa Rosa site may require a greater quantity of blasting for the excavation of the powerhouse. Potential hazards would be incrementally less at the Santa Rosa site based on the smaller number of near-site receptors and the greater separate distances between the powerhouse and existing residences.

Once operation, the same quantity of hazardous materials would be expected on the two powerhouse sites. The potential for exposure to those materials by any off-site sensitive receptors located near either property would, however, be minimal.

Development plans for the Ortega Oaks property include provisions of the incorporation of a hang glider landing area either at the upslope or downslope portion of the powerhouse site. Because hang gliding is an identified hazardous recreational activity, subject to the skill level of the pilot and changing meteorological conditions, a number of additional safety hazards would be associated with the Ortega Oaks powerhouse site.

◊ **Hydrology and Water Quality**. Since the quantity of impervious surfaces would generally be similar and since compliance with applicable water quality permits constitutes a pre-existing obligation, no appreciable difference in hydrologic or water quality impacts would result from the selection between the proposed Santa Rosa and the alternative Ortega Oaks powerhouse sites.

◊ **Land Use and Planning**. Only limited residential development currently exists in close proximity to the Santa Rosa powerhouse site. In comparison, residential uses directly abut the Ortega Oaks powerhouse site to the east of the site and to the west of Ortega Highway. Mountainside Ministries (30515 Ortega Highway, Lake Elsinore) is located to the north of Ortega Highway. In addition, while the Santa Rosa powerhouse site is not presently subject to any authorized land use, the Ortega Oaks site has historically been used as a landing zone for hang gliders launching from within the CNF. That use is now the subject of pending litigation between the Elsinore Hang Gliding Association and the property owner.

With regards to the Ortega Oaks powerhouse site, on April 20, 2004, the County Board of Supervisors approved Tract Map Nos. 22626 and 22626-1,[121,122]

[121]/ County of Riverside, Board of Supervisors Agenda Items Nos. 2.15 and 2.16, Tract Map Nos. 22626 and 22626-1, April 20, 2004.

subdividing the alternative powerhouse site into approximately 133 lots. As a result, prior to the Applicant's receipt of all requisite permits and approvals for the Applicant's Project, the Ortega Oaks property may transition from a vacant property to a tract of new single-family homes. If so developed, the utilization of the Ortega Oaks property for a powerhouse may become economically infeasible.

◊ **Mineral Resources**. Neither powerhouse site contains any known recoverable mineral resources.

◊ **Noise**. The Ortega Oaks property is located in close proximity to single-family residences and a religious use. The Santa Rosa site is located in close proximity to multi-family residential uses and an existing school facility. Construction on either the Ortega Oaks or the Santa Rosa powerhouse sites would, therefore, expose near-site sensitive receptors to short-term increases in ambient noise levels above levels existing without the construction of the Applicant's Project. Construction activities conducted on either property would be in conformance with the noise ordinances of the applicable jurisdiction.

◊ **Population and Housing**. Should the Santa Rosa powerhouse site be selected, the Applicant has indicated an intent to purchase the 12-unit Santa Rosa Mountain Villas (33071-33091 Santa Rosa, Lake Elsinore) and use those units for construction purposes. If required under applicable laws, the Applicant would provide relocation assistance to any displaced residences. In addition, independent of the site selected, one or more lakeshore properties would be acquired to accommodate the construction and operation of the proposed intake/outlet structure.

Should the Ortega Oaks site be selected, presently no residential units have been identified for purchase by the Applicant. As a result, the impacts on population and housing would be incrementally less under the Ortega Oaks option. Based on the size of the regional housing inventory, the incremental differences between the two sites would not be significant.

It is, however, noted that on April 20, 2004, the Riverside County Board of Supervisors approved Tract Map Nos. 22626 and 22626-1 (Board of Supervisors Agenda Item Nos. 2.15 and 2.16). Should the Ortega Oaks property be subsequently developed for single-family residential use prior to the commencement of construction operations, the impact of the demolition of those new homes and the displacement of any occupying households would be deemed significant.

◊ **Public Services**. The two alternative powerhouse sites would have a generally comparable impact upon police, fire protection, and vector control services.

[122]/ Tract 22626 was recorded in Book 354, Pages 91-95 of Miscellaneous Maps in the Recorders Office for the County of Riverside and Tract 22626-1 was recorded in Book 354, Pages 41-46 of Miscellaneous Maps in the Recorders Office for the County of Riverside, Assessors Parcel Numbers 386-120-028-6 and 386-120-029-7.

◊ **Recreation**. The Elsinore Hang Gliding Association and others have asserted a right to utilize the Ortega Oaks powerhouse site, or a portion thereof, as a landing site for recreational hang gliding originating from within the CNF. Although the Applicant has indicated an intent to develop a hang glider landing site upon the Ortega Oaks powerhouse site should that site be selected, the use of that property for any recreational purposes would need to be suspended during the facility's construction. As a result, there would be a short-term and less-than-significant impact upon recreation.

As proposed, new recreational facilities will be provided by the Applicant under FERC's hydropower license. Different but reasonably comparable facilities would be provided at either the Santa Rosa or Ortega Oaks powerhouse site. Additionally, independent of the site selected, construction of the intake/outlet structure extending from the powerhouse into Lake Elsinore would result in the closure of a portion of the lake to recreational use. The impacts on lake-related recreation from either powerhouse site would be similar.

◊ **Transportation and Traffic**. Because the Ortega Oaks powerhouse site abuts Ortega Highway and since vehicular access to that site would be limited to the use of that roadway, construction-related traffic would impose a greater impact on traffic along that State highway.

Prior to the commencement of construction operations, the Applicant would prepare a traffic management plan consistent with the California Department of Transportation's (Caltrans) "Manual of Traffic Controls for Construction and Maintenance Work Zones." Flag persons would be positioned to facilitate ingress and egress to and from the site by construction vehicles, result in short-term disruptions to traffic flow. As documented in Caltrans' "State Route 74 Safety Improvement Project from San Juan Canyon Bridge to Orange/Riverside County Line,"[123] implementation of a traffic management plan would reduce construction-term impacts to a less than significant level.

Construction activities conducted on the Santa Rosa powerhouse site would place construction traffic in close proximity to Butterfield Elementary Visual and Performing Arts Magnet School and the Ortega Trails Youth Center (16275 Grand Avenue, Lake Elsinore). Grand Avenue is the primary travel path used by children going to and coming from the elementary school and by adult caregivers dropping off and picking up children from those sites. Construction traffic would be expected to be heavier at the Santa Rosa site since all construction traffic would have to utilize Grand Avenue in order to access that powerhouse site. Heavy trucks entering and exiting the site may cross the path of children going to or coming from school. No sidewalks now exist along Grand Avenue along the Santa Rosa powerhouse site's frontage. In order to address potential safety hazards, a traffic management plan would be developed in consultation with the Lake Elsinore Unified School District.

[123]/ California Department of Transportation, Negative Declaration/Finding of No Significant Impact, State Route 74 Safety Improvement Project from San Juan Canyon Bridge to Orange/Riverside County Line, Orange County, California, October 13, 2005.

◊ **Utilities and Service Systems**. The two alternative powerhouse sites would have a generally comparable impact upon potable and non-potable water services and supplies.

◊ **Energy Resources**. The two alternative powerhouse sites would have a generally comparable impact upon energy resources.

▪ **Alternative No. 4 - "Alternative LEAPS Upper Reservoir Site."[124]** This alternative is proposed because it represents one of only two possible locations where the proposed LEAPS upper reservoir could be feasibly constructed.

The alternative Morrell Canyon reservoir site[125] is bounded by the San Mateo Canyon Wilderness Area to the south, South Main Divide Truck Trail (Forest Route 6S07) to the north, and Morgan Trail (Forest Route 7-s-12) to the west. The site, at elevation 2700 to 2900-feet AMSL, encompasses the area of "Lion Springs" (as identified on the USGS quadrangle). While Lion Spring is shown as a discrete point on published maps, the spring is actually a linear feature subjected to artesian groundwater pressure. Flows from Lion Spring, including tributary areas, would be maintained by constructing a subdrain collection system under the alternative reservoir site to collect and safely discharge flows downstream of that facility.

The Morrell Canyon site, depicted in Figure 6.2-5 (Alternative Morrell Canyon Upper Reservoir Sites), is about 3.1 miles (16,300 feet) upstream of where it flow under Ortega Highway. In comparison, the Decker Canyon site is about 2.1 miles (11,200 feet) upstream of its Ortega Highway crossing. The confluence of these two creeks is approximately 0.25 miles below the Morrell Canyon undercrossing of Ortega Highway. Below this confluence, the combined streamflow from Morrell and Decker Canyons flow into the San Juan Creek channel.

Of the three different configurations for the Morrell Canyon reservoir considered and described in the FLA, "Morrell Canyon - Alternative A-3" was identified by the Applicant as the optimal configuration (preferred project) in the FLA. Some general features of "Alternative A.3" include: (1) 180 foot-high main dam located on the southwest side of the reservoir; (2) perimeter dike ranging up to 60 feet high located along the northeast side of the reservoir; (3) normal reservoir water surface at elevation 2,880 feet AMSL; (4) inlet at elevation 2,760 feet AMSL for the intake structure; and (5) reservoir surface area of approximately 76 acres. The required fill volume of the dam and dike is approximately 2.5 million cubic yards. "Morrell Canyon - Alterative A-3" has been retained as an alternative to the proposed Decker Canyon reservoir.

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the Applicant's Project.

[124]/ Morrell Canyon was identified by the Applicant as the preferred upper reservoir site in the FLA. Additional information concerning Morrell Canyon, its existing environmental setting, and the potential impacts associated with the development and operation of a new reservoir at that location can be found in the FLA and FEIS, both of which are incorporated by reference herein.
[125]/ Sections 22, 23, and 27, T6S, R5W, SBBM, Lake Elsinore, Alberhill, and Sitton Peak USGS 7.5-Minute Topographic Quadrangles.

◊ **Aesthetics**. Activities associated with the construction of the upper reservoir would result in the introduction of construction equipment, including security lighting, into a relatively undisturbed landscape, involve the removal of existing vegetation, and the grading of the alternative site. Construction activities visible from South Main Divide Truck Trail would be viewed as disharmonious with the natural environment.

Both the Decker Canyon and alternative Morrell Canyon reservoirs sites exist along South Main Divide Truck Trail. A similar number of motorists and other observers pass by the two sites each day. Based on existing topography, Morrell Canyon may be partially screened from the roadway and could be further screened through the installation of additional road adjacent landscaping, thus reducing its potential impact.

The Morrell Canyon reservoir site is located adjacent to Morgan Trail, a Forest Service maintained hiking trail extending south from South Main Divide Truck Trail. Individuals traveling along that trail would have an unimpeded view of the reservoir. Although judgments as to the aesthetic value of a water element verse a terrestrial landscape would be subject to the individual perceptions of each viewer, the change in landscape would constitute a significant physical change.

◊ **Agricultural Resources**. Since neither the Decker Canyon nor the Morrell Canyon upper reservoir sites are presently used for any agricultural or farm-related use, the impacts on agricultural resources would be generally comparable.

◊ **Air Quality**. The quantity of construction-term and operational criteria emissions would not be expected to differ substantially between the two alternative upper reservoir sites. No sensitive receptors exist in close proximity to either area.

◊ **Biological Resources**. No protected wildlife species has been observed or are expected to occur in the area of the Morrell Canyon and Decker Canyon reservoir sites. However, based on the available of a seasonal source of water (Lion Springs), the Morrell Canyon site would appear more conducive to species occurrence. Coast live oak riparian woodland primarily occur in Morrell Canyon with a smaller stand present in Decker Canyon. With regards to coast live oaks, the provision of compensatory resources is required under Section 21083.4(b) of the PRC. In addition, the Forest Service has specified a replacement ratio of 2:1 (Condition No. 38: Habitat Mitigation Plan). Compliance with those obligations will reduce impacts on this sensitive plant species to a less-than-significant level.

◊ **Cultural Resources**. Sensitive cultural resources have been identified in the general area of Morrell Canyon (RIV-1082, RIV-2205, RIV-3836). No sensitive resources have, however, been identified in the area of the proposed Decker Canyon reservoir. Since in-situ preservation may not be feasible, grading activities within the Morrell Canyon area would likely result in the destruction of those cultural resources. No comparable impact would occur in the vicinity of the Decker Canyon reservoir.

◊ **Geology and Soils**. The two alternative upper reservoir sites would have a generally comparable impact upon geology and soils.

◊ **Hazards and Hazardous Materials**. No hazardous materials are known to exist in the vicinity of either the Morrell Canyon or the Decker Canyon sites. Since construction would result in the introduction of a comparable quantity of such materials, from a hazardous materials perspective, no substantive difference exists between the two sites.

As indicated by the United States Department of the Interior - Bureau of Reclamation: "The 1964 failure of the Baldwin Hills Dam, near Los Angeles, California, and the near failure of Lower Van Norman (San Fernando) Dam in 1971 prompted the State of California to enact statutes requiring dam owners to prepare dam failure inundation maps" and "[t]he Federal Guidelines for Dam Safety, dated June 25, 1979, stated that inundation maps be prepared."[126]

In accordance therewith, as presented in Figure 6.2-6 (Preliminary Upper Reservoir Inundation Map), preliminary inundation maps have been prepared for both the proposed Decker Canyon and the alternative Morrell Canyon upper reservoir sites.[127] A catastrophic breach of either the Decker Canyon or the Morrell Canyon reservoirs would cause inundation of downstream recreational areas, Ortega Highway road crossings, and some low-lying buildings, as well as scouring along San Juan Creek from the dam to the area of the I-5 Freeway under-crossing. Based on the analysis of the flow (discharge) through a hypothetical breach of either dam, the peak outflow would be less than 91,000 cubic feet per second (ft^3/s) for Morrell Canyon and about 115,000 ft^3/s for Decker Canyon.

The time to peak flow at the Morrell Canyon dam would be about 0.33 hours (20 minutes). The time to peak flow at the Decker Canyon dam would be about 0.28 hours (17 minutes). Downstream of the confluence of Morrell Canyon and Decker Canyon, the depths shown on the inundation map correspond to the Decker Canyon scenario since they are generally higher than the depths corresponding to the Morrell Canyon scenario.

Water flowing in the upstream portion of the channel below either dam would attain depths of about 30 feet for the Morrell Canyon scenario and about 33.5 feet for the Decker Canyon scenario. For Morrell Canyon, it is estimated that the peak discharge would reach the first stream crossing of Ortega Highway in approximately 0.45 hours (27 minutes), with a maximum depth of about 20 feet. Some inundation of the roadway would be expected at this street crossing because the existing culvert under Ortega Highway does not have sufficient capacity to convey the projected flow.

[126]/ United States Bureau of Reclamation, Prediction of Embankment Dam Breach Parameters – A Literature Review and Needs Assessment, DSO-98-004, July 1998, pp. 4-5.

[127]/ Detailed information concurring the development of the inundation maps, methodologies, and assumptions used in the derivation of those maps, and a description of the affected properties is presented "Conceptual-Level Inundation Study – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, Riverside County, California" (GENTERRA Consultants, Inc., August 28, 2003) and "Supplemental Report Conceptual-Level Inundation Study – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, Riverside County, California" (GENTERRA Consultants, Inc., December 12, 2003), included in the FLA..

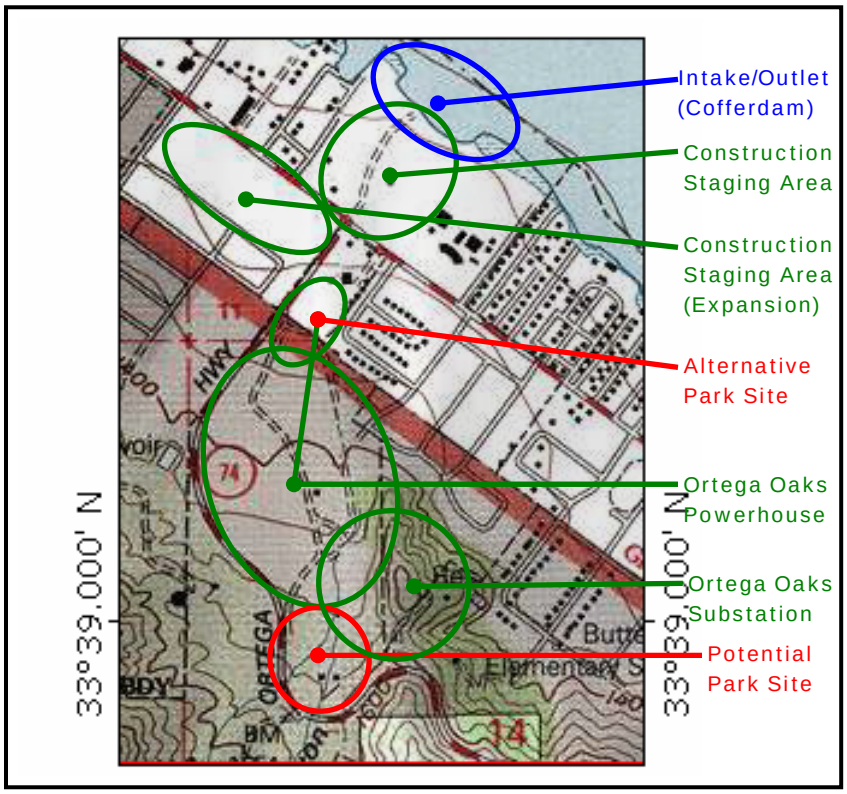


Figure 6.2-4
Alternative Ortega Oaks Powerhouse and Substation Sites
Source: The Nevada Hydro Company, Inc.

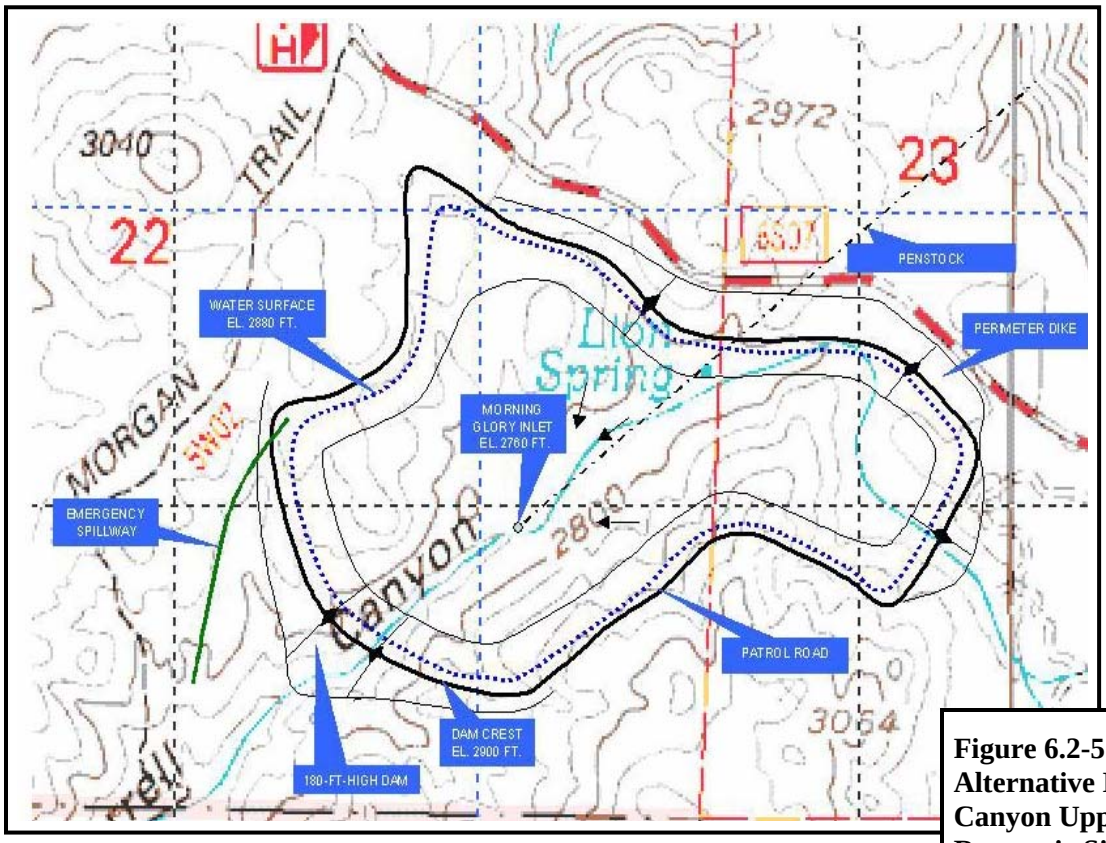


Figure 6.2-5
Alternative Morrell Canyon Upper Reservoir Site
Source: The Nevada Hydro Company, Inc.

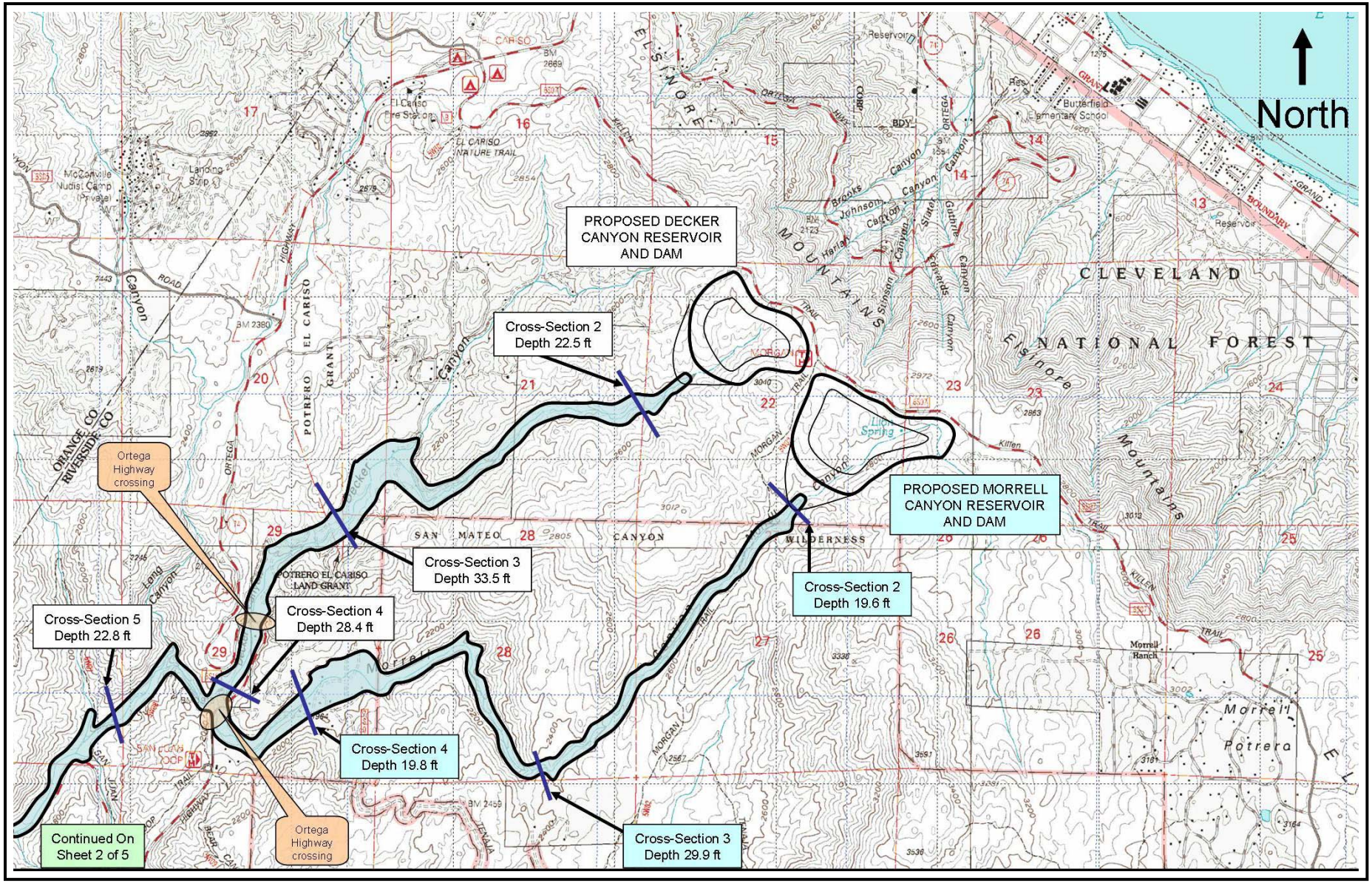


Figure 6.2-6 (1 of 6) Preliminary Upper Reservoir Inundation Map - Sheet 1

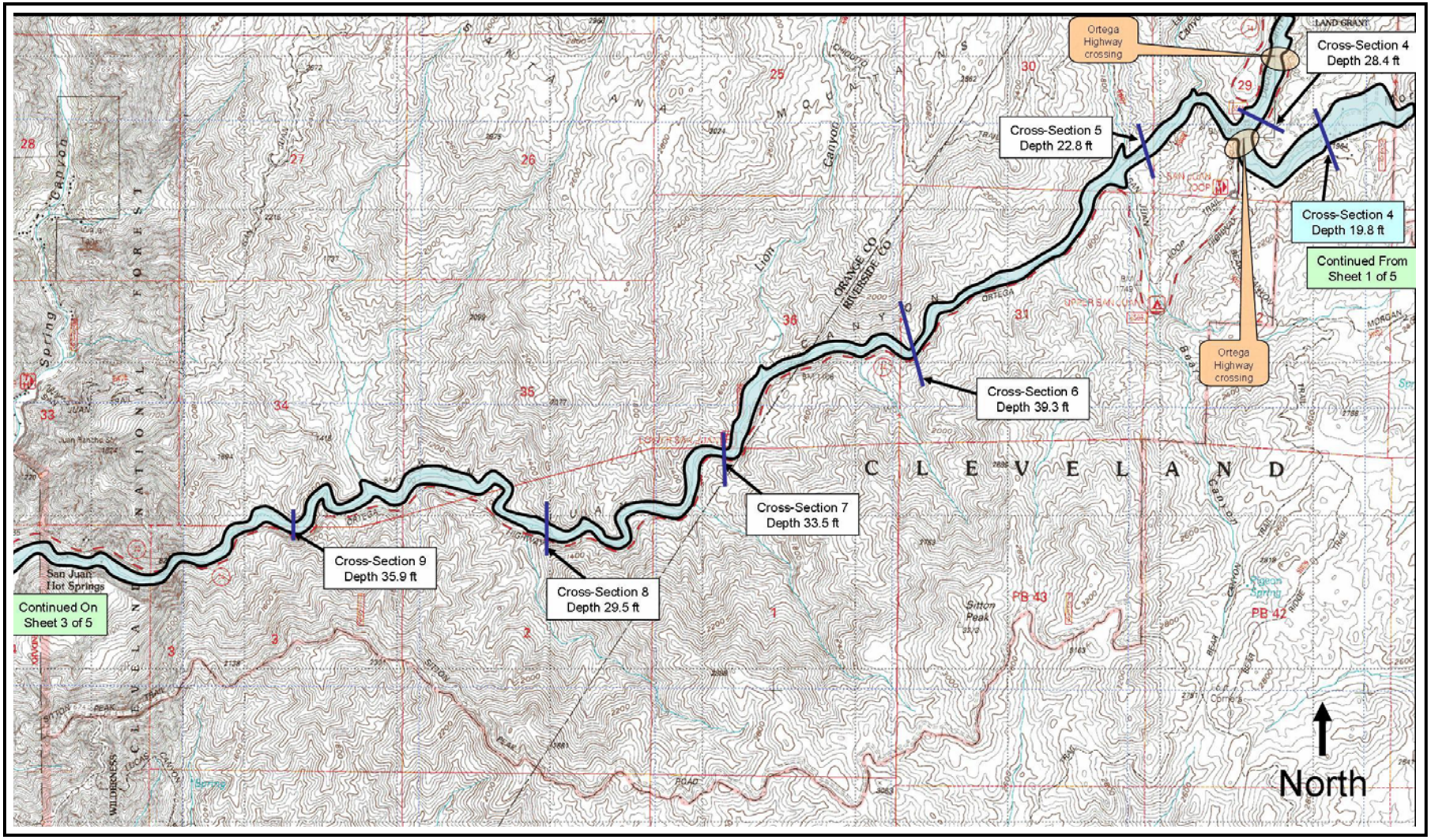


Figure 6.2-6 (2 of 6) Preliminary Upper Reservoir Inundation Map – Sheet 2
Source: GENTERRA Consultants Inc.

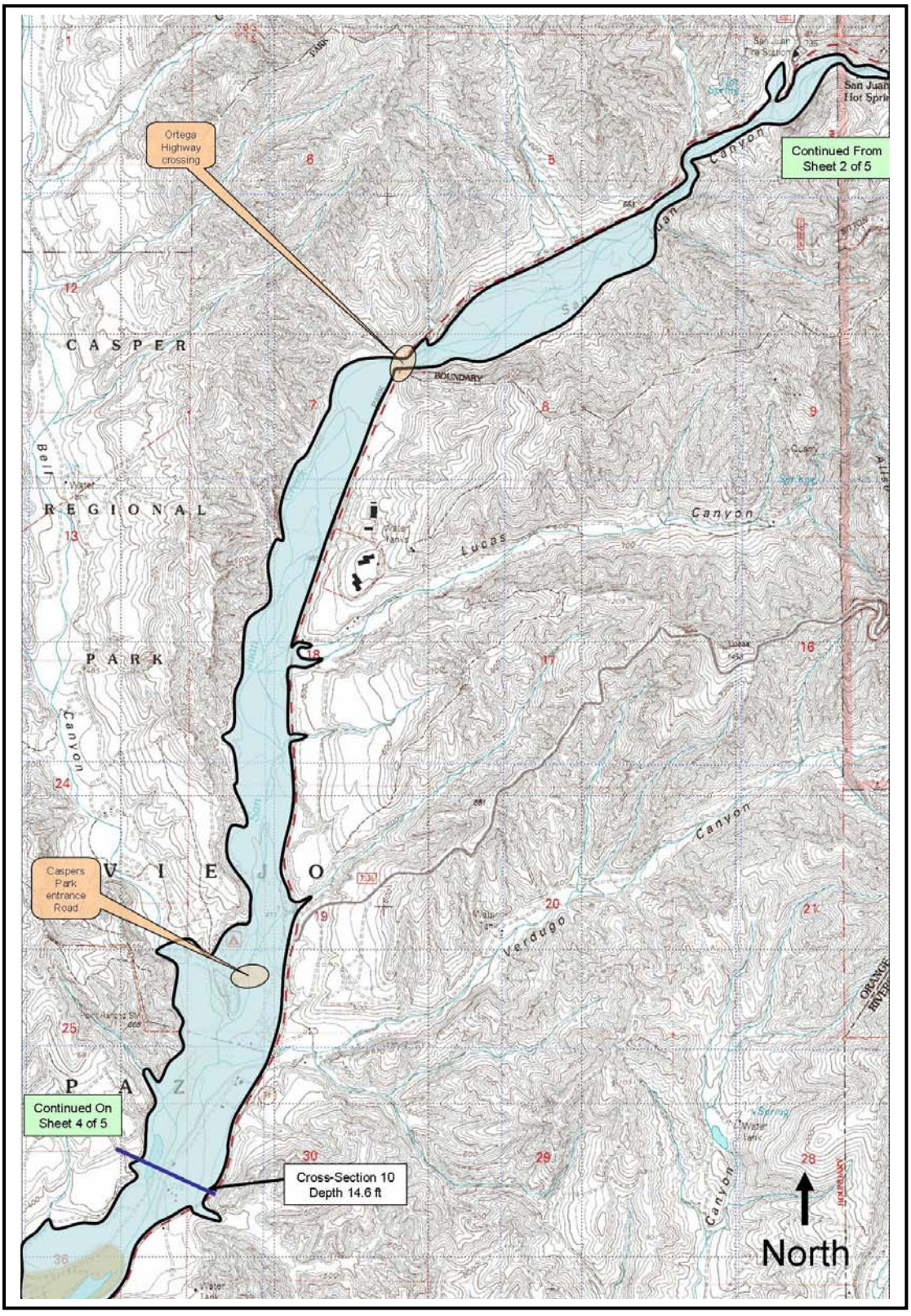


Figure 6.2-6 (3 of 6) Preliminary Upper Reservoir Inundation Map – Sheet 3
Source: GENTERRA Consultants Inc.

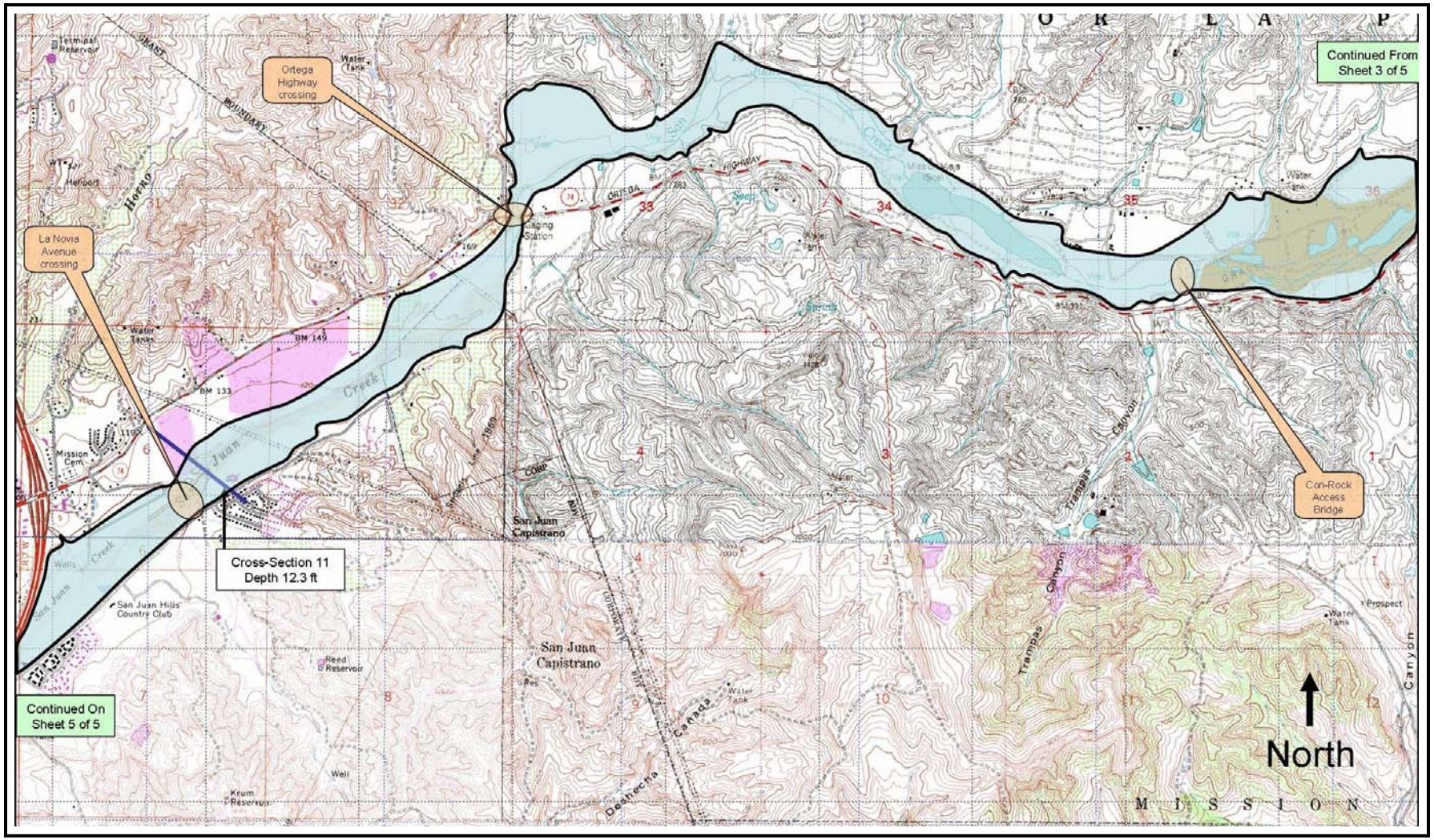


Figure 6.2-6 (4 of 6) Preliminary Upper Reservoir Inundation Map – Sheet 4
Source: GENTERRA Consultants Inc.

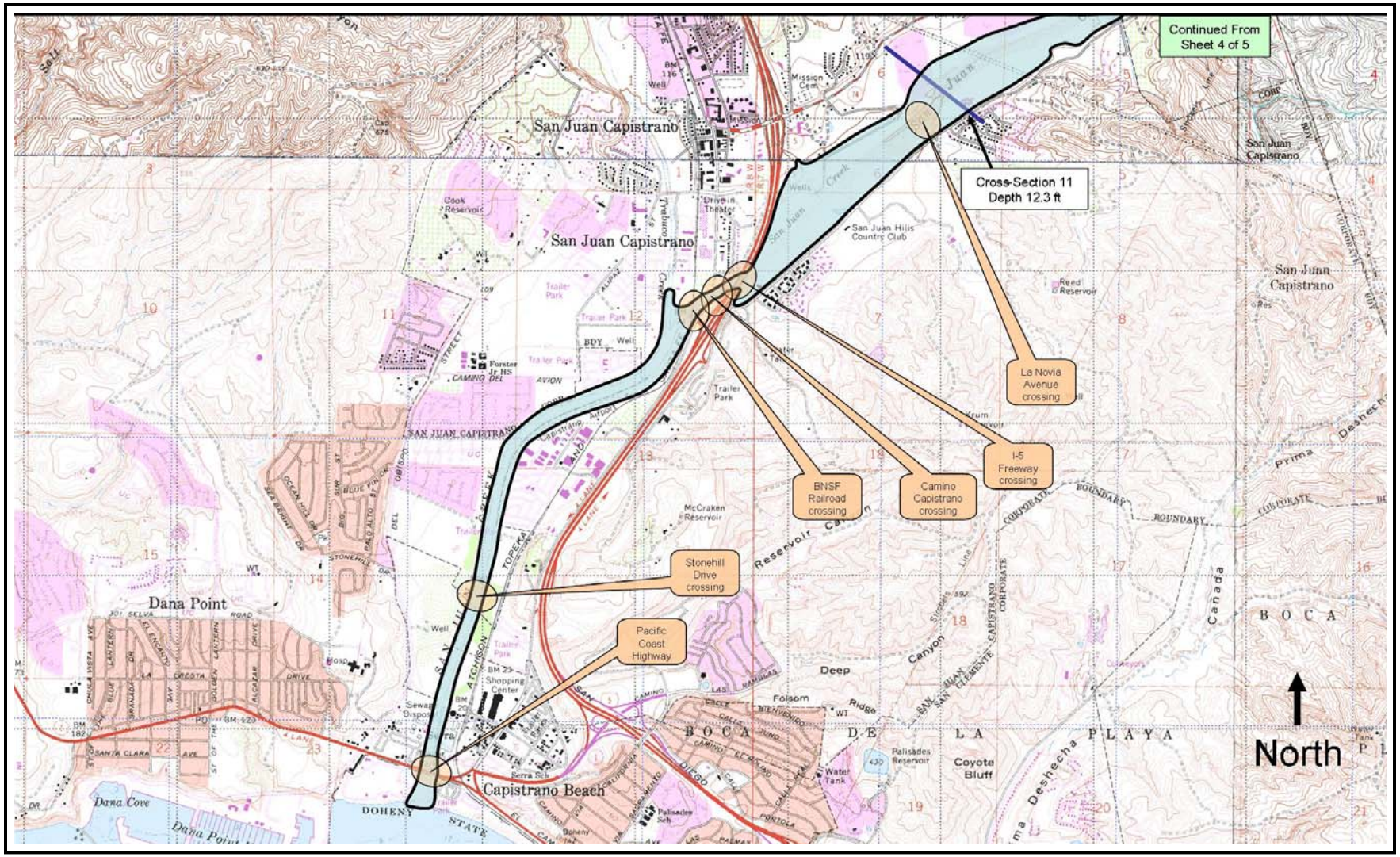


Figure 6.2-6 (5 of 6) Preliminary Upper Reservoir Inundation Map – Sheet 5
Source: GENTERRA Consultants Inc.

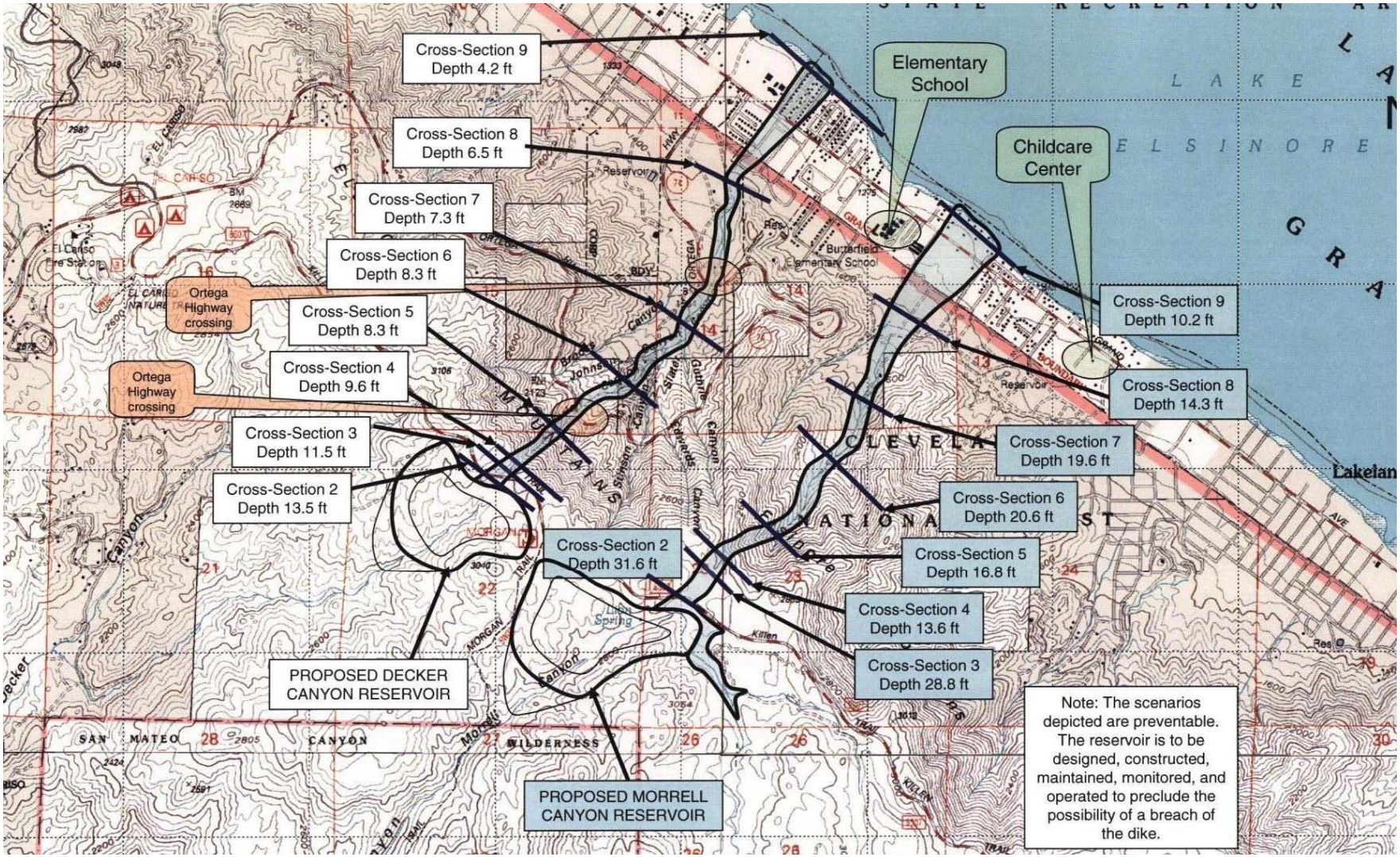


Figure 6.2-6 (6 of 6) Preliminary Upper Reservoir Inundation Map – Sheet 6
Source: GENTERRA Consultants Inc.

The first stream crossing of Ortega Highway in the Decker Canyon scenario would have a peak depth of about 28 feet and would arrive in approximately 0.38 hours (23 minutes). Some inundation of the roadway would be expected at this street crossing because the existing culvert under Ortega Highway does not have sufficient capacity to convey the projected flow. The flooding would inundate low-lying areas of the Forest Service campground that is located just downstream of the Ortega Highway crossing.

Farther downstream, two other areas along the San Juan Creek channel would experience relatively deeper flows during the period of peak discharge. The model simulation shows the greatest flow depths in the vicinity of the Riverside County – Orange County line, where the maximum depth of flow would reach approximately 37 feet for the Morrell Canyon scenario and 39 feet for the Decker Canyon scenario. The other areas of relatively deeper flows is located approximately one mile east (upstream) of San Juan Hot Springs in Orange County. San Juan Canyon has relatively steep sides through this reach. Through this area, the depth of flow would attain a maximum of about 36.4 feet for the Morrell Canyon scenario and about 35.9 feet for the Decker Canyon scenario.

San Juan Creek passes near the southern boundary of Ronald W. Caspers Wilderness Park at its confluence with Bell Canyon Creek. As the flood wave moves past the park, the entrance road, visitor's center, and several campgrounds located upstream along the banks of Bell Canyon Creek are likely to be subject to flood inundation. Below Ronald W. Caspers Wilderness Park, San Juan Creek traverses the Rancho Mission Viejo Company's (RMVC) approved "The Ranch" development (General Plan Amendment/Zone Change PA01-114). Preliminary inundation maps were submitted to the County of Orange and to the RMVC as part of the separate CEQA process conducted for that development. By the time the flood wave reaches the confluence of Trabuco Creek, it would have attenuated to well below 50,000 ft^3/s, which is less than the peak flow of the 100-year storm event (58,600 ft^3/s).

The preliminary inundation maps were prepared for an earlier reservoir design that included both a dam and dike configuration, placing the water elevation in the upper reservoir above the height of South Main Divide Road. The upper reservoir design plans have been subsequently modified to eliminate the dike and reduce the elevation of the stored water.

Based on the earlier design plans, a catastrophic failure of either reservoir could potentially result in an overtopping of the ridgeline separating Morrell and Decker Canyons from Lake Elsinore. In that event or in the event of an overtopping of the dike crest and/or internal erosion through the dike embankment material, waters could discharge toward Lake Elsinore. In order to assess potential inundation hazards under that scenario, it was assumed that the direction of outflow from the breach was oriented perpendicularly toward nearby low points along the South Main Divide Truck Trail roadway and that the momentum of escaping water was sufficient to force the water over the ridgeline and down the

slope toward Lake Elsinore to the northeast, ignoring the quantity of water that would be retained south of the roadway.

The estimated extend of flood inundation for the Morrell Canyon scenario was based on a peak outflow (discharge) of approximately 60,300 ft^3/s through the breach. For the Decker Canyon scenario, the corresponding peak outflow would be about 6,130 ft^3/s. The time to peak flow at the dike due to the breach of the Morrell Canyon reservoir would be approximately 0.30 hours (18 minutes). At the last modeled cross section, near Lake Elsinore (1.76 miles downstream), the maximum depth at the deepest point would be about 10.2 feet.

For Decker Canyon, the time to peak flow would be about 0.28 hours (17 minutes). At the last modeled cross section, near Lake Elsinore (1.76 miles downstream), the maximum depth at the deepest point would be about 4.2 feet.

Comparison of the flows produced for the two dike breach scenarios revealed that the peak outflow for the Decker Canyon simulation is an order of magnitude lower that the peak outflow for the Morrell Canyon simulation. This outcome is due to the lower maximum water level elevation for the earlier Decker Canyon reservoir design compared to the water level for the earlier Morrell Canyon reservoir design.

For the Morrell Canyon reservoir scenario, there are no stream crossings of Ortega Highway. In comparison, there are two stream crossings of Ortega Highway for the Decker Canyon scenario. The transitory flow of water over the roadway at these crossings has the potential to temporarily block traffic, wash away any vehicles traveling along that State highway, and to cause erosion of the roadway embankment. Similarly, flood waters from both reservoir sites would cross Grand Avenue, temporarily block traffic, and place vehicles and their occupants at risk.

For the Morrell Canyon scenario, the inundation analysis indicated that Butterfield Elementary Visual and Performing Arts Magnet School (16275 Grand Avenue, Lake Elsinore) and Lakeland Children Center (17159 Grand Avenue, Lake Elsinore) are outside the flow pathways. A number of single-family homes, located between Santa Rosa Drive and Magnolia Street are, however, located with the resulting flood zone.

Following the commencement of operations, the Applicant proposes to construct a neighborhood park in the vicinity of the Santa Rosa substation site, adjacent to Grand Avenue. Based on the earlier reservoir design, that proposed park site is located within the inundation area for the Morrell Canyon upper reservoir.

For the Decker Canyon scenario, a number of single-family residences located along Ortega Highway and in proximity to Grand Avenue are located within the flood inundation zone. Residential areas located in the Decker Canyon flood zone include residents located along Lighthouse, Shoreline, Bonnie Lae, Pepper, Cedar, and Oleander Drives, and Leeward and Anchor Ways. Additionally, based on the

earlier design plans, Mountainside Ministries (30515 Ortega Highway, Lake Elsinore) appears to be located within the flow path for the Decker Canyon reservoir.

A downstream hazard is defined as "the potential loss of life or property damage downstream of a dam from floodwaters released at the dam or waters released by partial or complete failure of the dam."[128] Downstream hazard classification does not correspond to the condition of the dam or appurtenant works nor the anticipated performance or operation of the dam. It is a description of the setting in areas downstream of the dam and an index of relative magnitude of the potential consequences to human life and property should the dam fail. Hazard classification is based on the size of the dam and an estimation of potential structural damage and risk to human life in case of a dam failure. Large-size dams may be defined as those that are 100 feet or higher or have a reservoir volume of a least 1,000 acre-feet. Since the LEAPS' upper reservoir will be approximately 5,500 acre-foot in size and since the dam is expected to be greater than 100 feet in height, that facility would be classified as being a "large-size" dam.

As defined by the United States Bureau of Reclamation, a "significant hazard dam" is "[a] dam which places 1-6 lives at risk or would cause appreciable economic loss (rural area with notable agriculture, industry, work sites, or outstanding natural resources)." A "high hazard dam" is defined as "[a] dam which places more than 6 lives at risk or would cause excessive economic loss (urban area including extensive community, industry, agriculture, or outstanding natural resources)."[129]

As defined by FERC: "Dams in the high hazard potential category are those located where failure may cause serious damage to homes, agricultural, industrial and commercial facilities, important public utilities, main highways, or railroads, and there would be danger to human life. . .Included in the high hazard potential category are dams where failure could result in loss of life of people gathered for an unorganized recreational activity where concentrated use of a confined area below the dam is a common annual occurrence during certain times of year."[130] As defined by the Interagency Committee on Dam Safety: "Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life. The hazard potential classification assigned to a dam should be based on the worst-case failure condition, i.e., the classification is based on failure consequences resulting from the failure condition that will result in the greatest potential for loss of life and property damage."[131]

A dam constructed to form the proposed Decker Canyon or the alternative Morrell Canyon reservoir would have a "high-hazard" classification, based on the

[128]/ Ad Hoc Committee of Dam Safety of the Federal Coordinating Council for Science, Engineering and Technology, Federal Guidelines for Dam Safety, Washington DC, June 1979.
[129]/ United States Bureau of Reclamation, Reclamation Manual FAC 06-01, Reclamation Dam Safety Program, January 8, 2002, p. 2.
[130]/ *Op. Cit*., Engineering Guidelines for the Evaluation of Hydropower Projects, p. 1-2.
[131]/ Federal Emergency Management Agency, Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners, FEMA 333, Interagency Committee on Dam Safety, October 1998, Section III(B)(3).

classification system outlined by the United States Army Corps of Engineers,[132] indicating the potential for loss of six or more lives should a catastrophic failure occur. Based on existing development near Lake Elsinore, the potential for loss of life would appear incrementally greater from the Decker Canyon upper reservoir site.

As indicated by the United States Department of the Interior: "As potential targets for acts of terrorism, hydroelectric dams present unquantifiable costs in terms of diminished national security. The damage resulting from failure of a conventional hydroelectric facility could be severe in terms of lives lost and electricity supply disruption. As the same time. . .a real but not readily quantifiable benefit of conventional hydropower is its contribution to U.S. energy independence."[133]

Compliance with applicable federal and State dam construction, safety, and monitoring requirements, including implementation of a dam safety surveillance monitoring plan, will reduce potential hazards to the maximum extent feasible.

◊ **Hydrology and Water Quality**. Decker Canyon is located at the headwaters of the watercourse and has no contributing upstream drainage. Conversely, the drainage area upstream of the Morrell Canyon site is approximately 560 acres (0.9 square miles). The runoff generated from a 100-year rainfall event from that upstream area would produce a peak flow of about 2,200 ft^3/s. Based on the presence of Lion Springs, as evidenced by the coast live oak riparian forest that exists within Morrell Canyon, additional stream flows exist at that site. A significant impact would likely exist if the construction of the alternative Morrell Canyon reservoir were to reduce or eliminate flows from Lion Springs and/or impede the conveyance of storm waters to downstream areas. Engineering studies demonstrate that both upstream and Lion Springs flows can be safely and effectively conveyed to a point of discharge downstream from the dam area.

◊ **Land Use and Planning**. Within the TRD, existing plans and policies allows for the construction and subsequent operation of the proposed and/or the alternative reservoir sites for the propose use. As such, the two upper reservoir sites would have a generally comparable land use and planning impact.

◊ **Mineral Resources**. Neither upper reservoir site contains recoverable mineral resources.

◊ **Noise**. The two upper reservoir sites would have a generally comparable noise impacts.

◊ **Population and Housing**. The two alternative upper reservoir sites would have a generally comparable impact upon population and housing.

[132]/ United States Army Corps of Engineers, Engineering and Design – Earthquake Design and Evaluation for Civil Works Projects, ER 1110-2-1806, July 31, 1995, Appendix B.

[133]/ Weiss, John C., Boehlert, Brent B., and Unsworth, Robert E., Assessing the Costs and Benefits of Electricity Generation Using Alternative Energy Resources on the Outer Continental Shelf – Final Report, MMS 2007013, United States Department of the Interior, Minerals Management Service, March 2007, p. 39.

- ◊ **Public Services**. The two alternative upper reservoir sites would have a generally comparable impact upon police, fire protection, and vector control services.

- ◊ **Recreation**. Because of its proximity to Morgan Trail, accessibility from South Main Divide Truck Trail, existing oak woodland, and presence of Lion Springs, Morrell Canyon receives frequent recreational use. Conversely, although more visible from South Main Divide Truck Trail, there exists no trails to facilitate public access into Decker Canyon area. Construction and construction staging activities conducted at either reservoir site would not directly impact the Elsinore Hang Gliding Association's existing launch sites. In accordance with the provisions of the federal hydropower license and the Forest Services 4(e) conditions, subject to Forest Service specifications, new recreational facilities will be provided independent of which upper reservoir site is selected.

- ◊ **Transportation and Traffic**. The two alternative upper reservoir sites would have a generally comparable impact upon transportation and traffic.

- ◊ **Utilities and Service Systems**. The two alternative reservoir sites would have a generally comparable impact upon potable and non-potable water services and supplies.

- ◊ **Energy Resources**. The two alternative reservoir sites would have a generally comparable impact upon energy resources.

- **Alternative No. 5 - "Alternative Lake Switchyard Site."** Based on information obtained from SCE, the Applicant is aware that SCE has initiated preliminary planning for unconnected improvements to the existing 115 kV distribution system in a portion of western Riverside County. Although no detailed siting information is available, it is the Applicant's understanding that SCE may be considering the development of a new 500/115 kV substation on an approximately 50-acre site in the Glen Ivy/Alberhill area of unincorporated Riverside County. Based on constraints imposed by the proximity of Temescal Canyon Road and the I-15 (Corona) Freeway, the Applicant's proposed Lake switchyard site may not sufficiently sized and configured to accommodate that facility when and if it should be developed.

  Although the Lake switchyard and an as yet unspecified SCE substation have separate utility, there may exist tangible environmental benefits that would result from the proximal siting of those two facilities. As such, the Applicant has sought to identify other properties in the general project area and to the south and east of the proposed Lake switchyard that could potentially accommodate both uses.

  As illustrated in Figure 6.2-7 (Alternative Lake 500 kV Switchyard Site), in order to adequately accommodate both the Applicant's proposed switchyard, SCE's future and unconnected distribution substation, and minimize the number of 500 kV interconnections located in relatively close proximity, in addition to the Applicant's proposed Lake switchyard site, an alternative switchyard site has been identified in the general vicinity of the I-15 (Corona) Freeway and Temescal Canyon Road. The alternative Lake switchyard site is approximately two miles southeast of the Applicant

proposed Lake switchyard and accessible from Temescal Canyon Road. A Conceptual Single line diagram is shown in Figure 6.2-7a (Alternative Lake Substation Conceptual Single Line Diagram.

The approximately 10-acre alternative Lake switchyard site[134] is generally located to the north of Temescal Canyon Road and the I-15 Freeway, east of Horsethief Canyon Road, and west of Lake Street in the unincorporated Glen Ivy/Alberhill area of Riverside County. This alternative site is relatively flat and contains both vacant, an existing horse ranch, and at least one residence. Because the property has been previously disturbed, the alternative switchyard area contains limited habitat value. Much of the surrounding area is vacant or used for equipment storage purposes. As such, unlike the Applicant proposed Lake switchyard site, other than Temescal Creek, there does not appear existing physical constraints that would preclude the development of an approximately 50-acre 500/115 kV substation.[135]

Although the location, shape, and configuration of the alternative Lake switchyard is different than that of the Applicant's proposed Lake switchyard, the purpose, function, and component parts of the two switchyard sites would be generally the same. Independent of the location selected, the switchyard will be designed in accordance with applicable SCE specifications.

As with the Applicant proposed Lake switchyard, the alternative switchyard site will be split into the following parts: 500 kV connection to the existing Valley-Serrano 500 kV transmission line and 500 kV connection to the new Lake-Case Springs transmission line. Facility design would not foreclose a future electrical connection to a SCE-proposed and unconnected 500/115 kV substation but would not include that substation as part of the Applicant's Project.

Based on a variety of factors, it would not be desirable to construct two separate 500 kV interconnections within as short a distance as separates the Applicant's proposed Lake switchyard and the alternative Lake switchyard sites. As such, should an independent SCE 500/115 kV substation be developed in the general area at an unspecified future date, an electrical connection between that future substation and the Lake switchyard (independent of the site selected) would likely need to be established. Any modifications to the Lake switchyard that may be needed to accommodate that electrical connection would be a part of a later SCE-submitted application to the Commission.

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the Applicant's Project. Only those topical areas where environmental impacts may differ from those associated with the Applicant's Project are discussed below.

[134]/ The referenced acreage is not inclusive of the additional lands associated with the 500 kV connection to the existing Valley-Serrano 500 kV transmission line, the access roads associated with those new transmission towers, and any additional areas of temporary disturbance associated with the facility's construction.

[135]/ Although a future SCE 500/115 kV SCE substation is referenced herein, that substation is not a part of the Applicant's Project since: (1) both facilities could separately operate, such that one facility is not dependent upon the other for its operations; (2) SCE has not filed an application with the Commission for that use, no development schedule exists, and any information concerning that future SCE facility is speculate; (3) the Applicant is not in possession of any detailed siting information which would illustrate the precise location of that facility. The inclusion of this alternative herein is based on the assumption that the cumulative impacts of the two independent and unconnected facilities might be minimized if total site disturbance and if the number of 500 kV interconnections could be reduced.

◊ **Aesthetics**. Because the alternative Lake switchyard may be air-insulated (AIS) and the Applicant proposed Lake switchyard is a gas-insulated (GIS), the visual character of the two sites would differ, including the presence of a smaller footprint associated with the use of GIS technology. Although both sites would be visible from the I-15 Freeway, the Applicant proposed switchyard is located directly adjacent to the freeway (providing a foreground view from passing motorists) while the alternative switchyard site is located further from that arterial (providing a middle-ground view from passing motorists). Since the freeway is located at a higher elevation that either switchyard site, visual screening would have limited effectiveness. The I-15 Freeway is not, however, designated as a scenic highway in the general area and numerous industrial uses presently exist in close proximity. As a result, although the Applicant's Project will result in a substantial physical change to either switchyard site, independent of the site selected, the aesthetic impacts of that change would not be deemed significant.

◊ **Agricultural Resources**. Since neither the proposed nor the alternative Lake substation sites are presently used for any agricultural use, the impacts on agricultural resources would be generally comparable. The alternative switchyard 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 visual observation.

◊ **Air Quality**. During construction, the quantity of construction-term criteria emissions would not be expected to differ substantially between the two alternative switchyard sites. Because the two switchyard sites are relatively small, grading and associated construction activities would not be expected to result in an exceedance of the South Coast Air Quality Management District's (SCAQMD) recommended threshold criteria.

Sulfur hexafluoride (SF_6), a non-toxic and non-flammable gas, is used for the insulation of GIS technology. The USEPA has identified sulfur hexafluoride as a greenhouse gas (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 USEPA standards,[136] potential air quality impacts associated with that use would be less than significant.

◊ **Biological Resources**. The Applicant proposed Lake switchyard 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 use consists of active storage facilities for construction equipment. The remainder of the property is undeveloped. 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, pedestrian

[136]/ United States Environmental Protection Agency, Substation Maintenance – Electrical Operating Procedures, EOP 430.51.4, March 28, 2005.

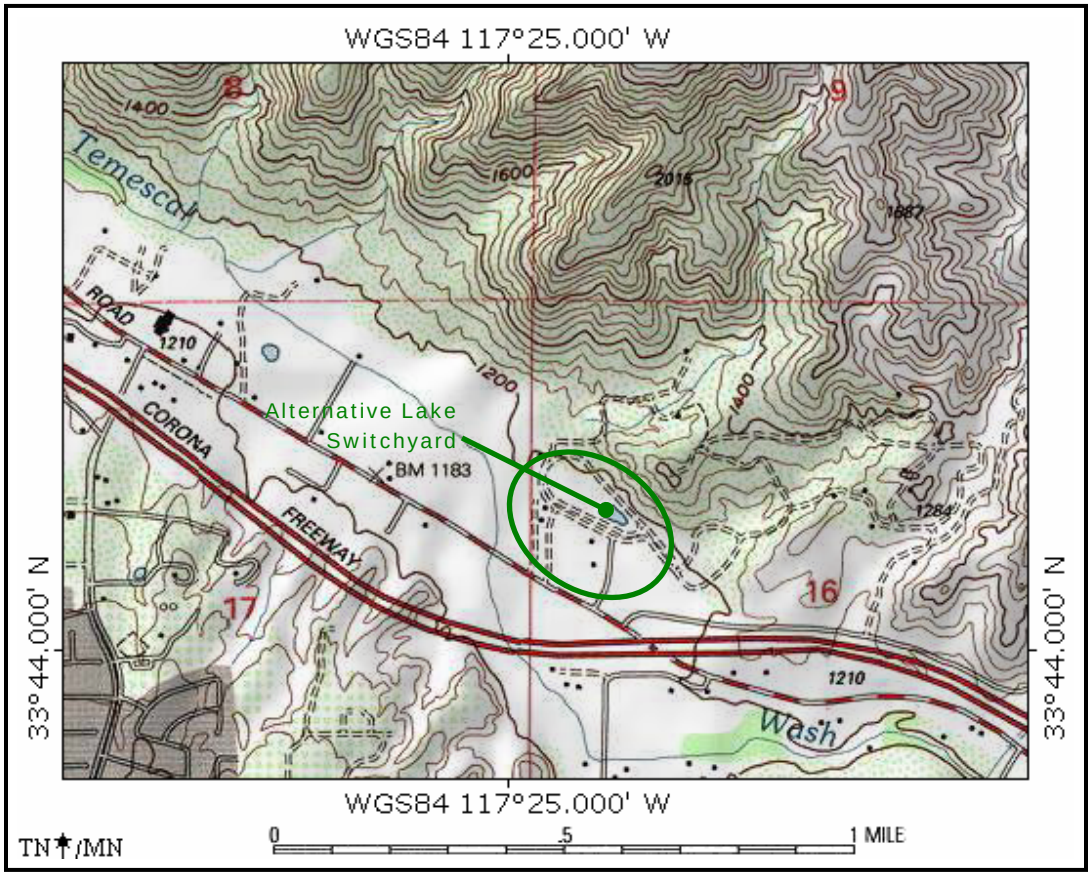
traffic. Based on the findings of the 2008 focused surveys, there are no sensitive plant or wildlife species present within the area of the Lake substation.

Portions of the alternative Lake switchyard and its associated 500 kV connection to the existing Valley-Serrano 500 kV transmission line may, however, 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 alternative Lake switchyard 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 alternative Lake switchyard do 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 varied through on-site biological surveys, this alternative switchyard 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 alternative switchyard site during the nesting period.

There are areas within the immediate vicinity of the proposed and alternative switchyard sites that contain jurisdictional drainage features. Careful switchyard siting would allow for the facility's development, on either site, which avoids or minimizes 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.



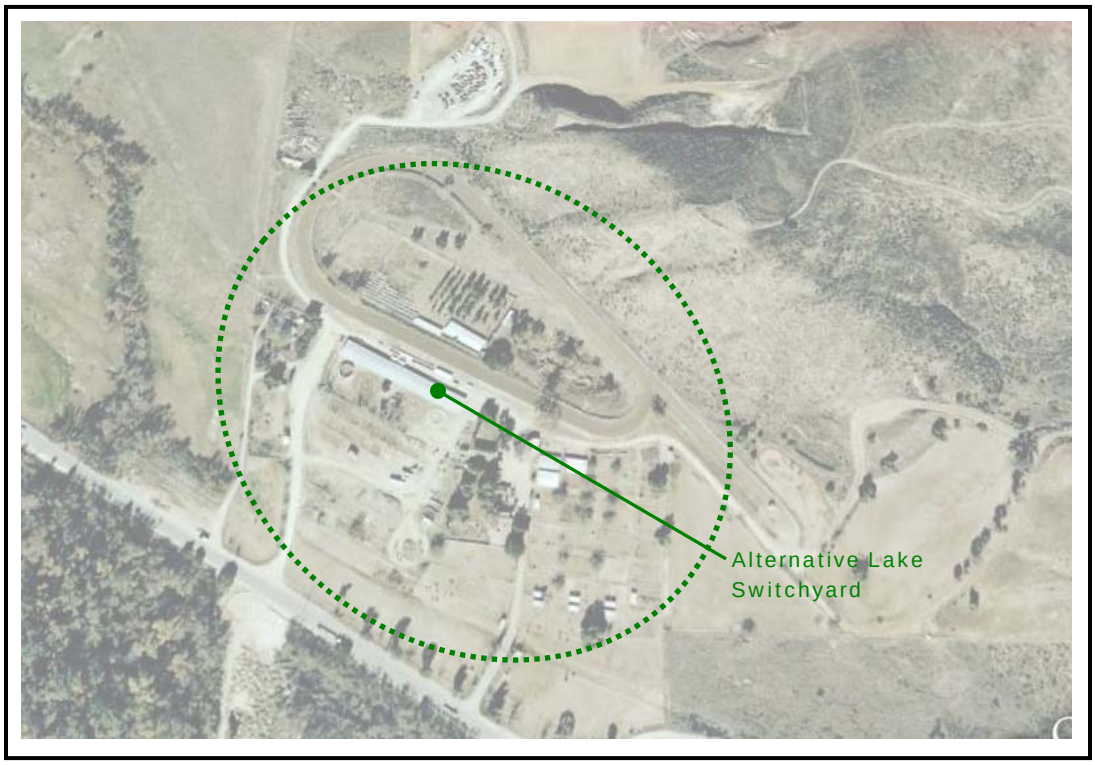


Figure 6.2-7 Alternative Lake Switchyard Site
Source: The Nevada Hydro Company, Inc.

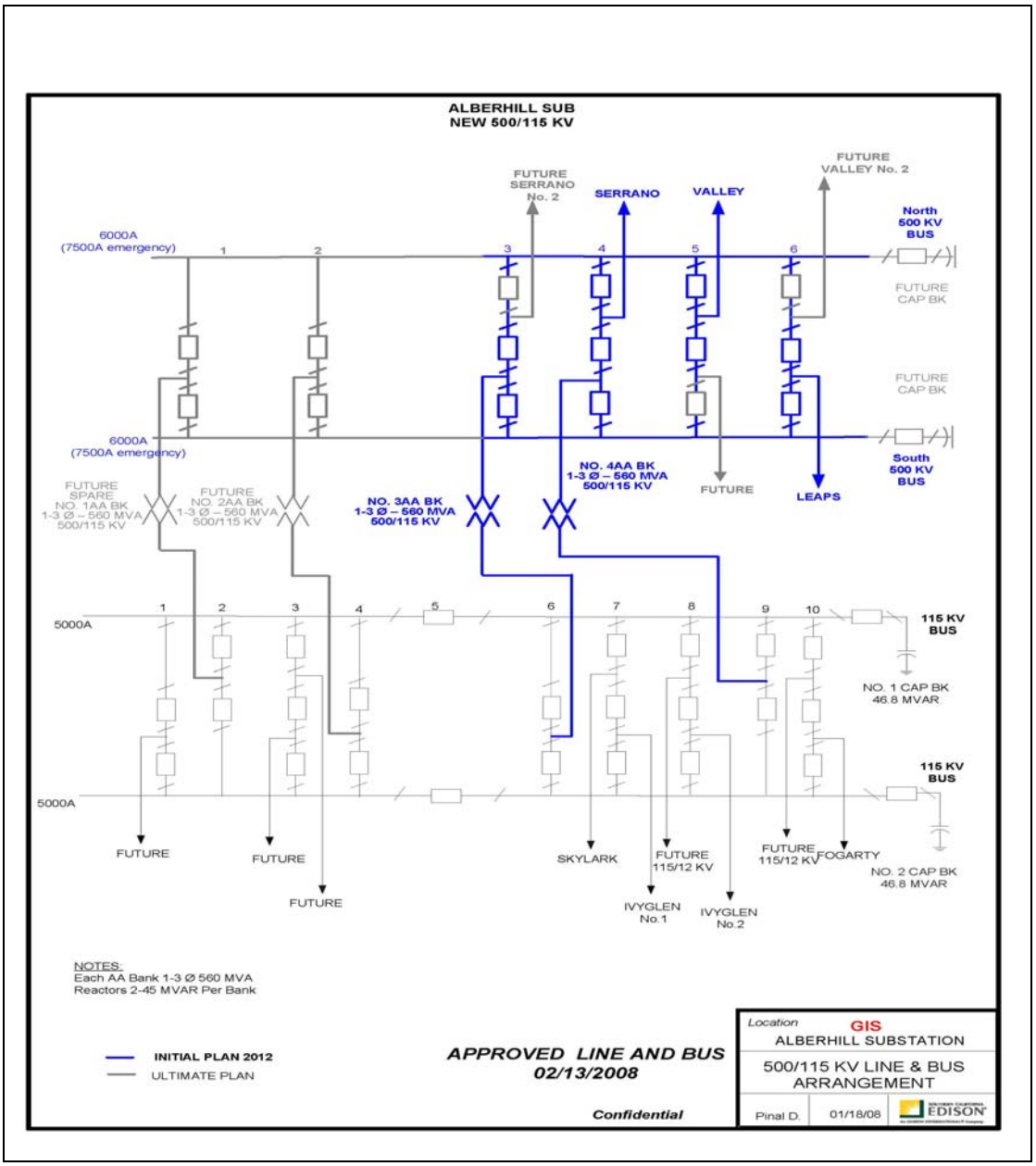


Figure 6.2-7a Alternative Lake Substation Conceptual Single Line Diagram

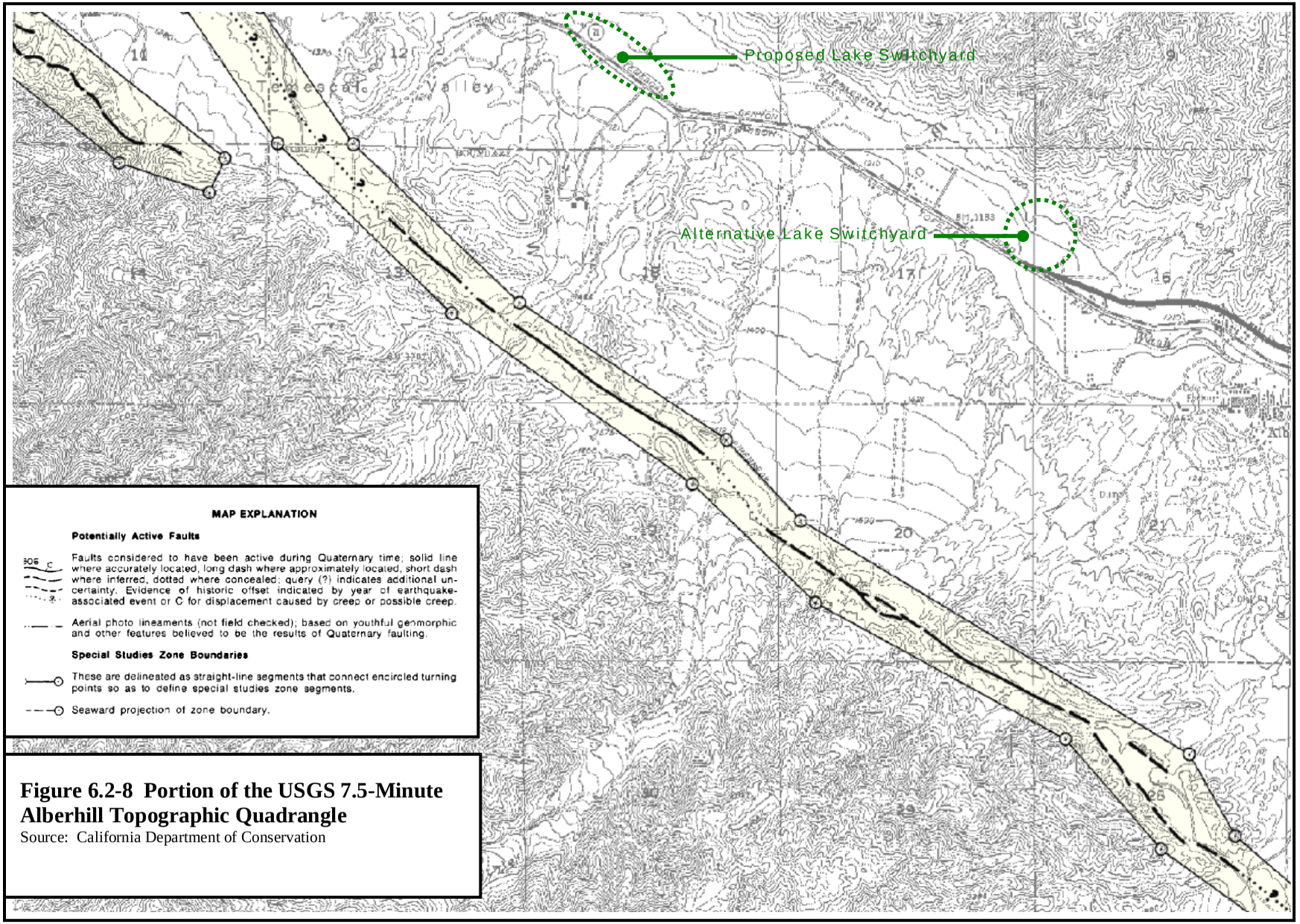


Figure 6.2-8 Portion of the USGS 7.5-Minute Alberhill Topographic Quadrangle
Source: California Department of Conservation

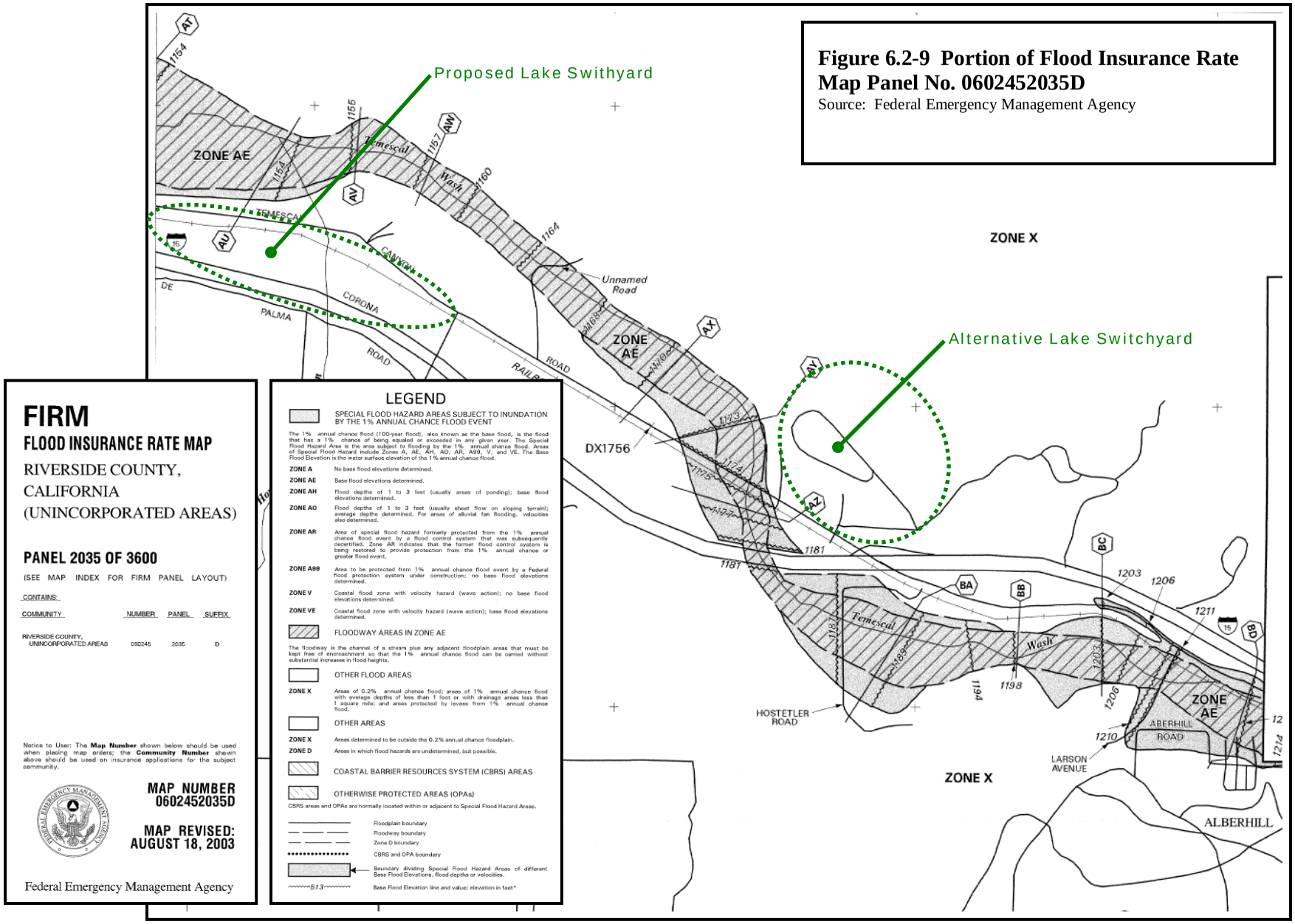


Figure 6.2-9 Portion of Flood Insurance Rate Map Panel No. 0602452035D
Source: Federal Emergency Management Agency

◊ **Cultural Resources**. No cultural resources have been identified or are suspected to occur on the alternative switchyard site.

◊ **Geology and Soils**. As illustrated in Figure 6.2-8 (Portion of the USGS 7.5-Minute Alberhill Topographic Quadrangle), neither of the two switchyards sites is 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 switchyard, 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 switchyard 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 on the two sites 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 switchyard site will not result in the release or hazardous materials within one-quarter mile of an existing or proposed school site. Neither switchyard 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 Lake switchyard sites are located within the jurisdiction of the Regional Water Quality Control Board, Santa Ana Region (SARWQCB); however, because the Applicant's 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 alternative Lake switchyard 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 proposed Lake switchyard 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.

As illustrated in Figure 6.2-9 (Portion of Flood Insurance Rate Map Panel No. 0602452035D), as illustrated in FEMA's applicable FIRM map, neither the proposed Lake switchyard nor the alternative Lake switchyard sites are located within a 100 year flood plain.[137] Independent of the switchyard's location, compliance with applicable water quality permit requirements will ensure that impacts on surface and water quality will be reduced to a less-than-significant level.

[137]/ Both sites are categorized as "Zone X," defined as areas of 0.2percent annual chance flood; areas of 1percent annual chance flood with average depth of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levee from 1percent annual change flood.

◊ **Land Use and Planning**. Both switchyard 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 switchyard would 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 switchyard 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 switchyard would 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 switchyard sites would have a generally comparable noise impacts. Noise impacts would generally be limited to the construction term.

◊ **Population and Housing**. The Applicant proposed and the alternative switchyard sites would have a generally comparable impact upon population and housing.

◊ **Public Services**. The switchyard 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 switchyard sites would have a generally comparable impact upon police, fire protection, and vector control services.

◊ **Recreation**. Neither the proposed nor the alternative switchyard 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 Applicant proposed Lake switchyard to the 500 kV connection to the existing Valley-Serrano 500 kV transmission line may encroach into the air space located above the surface 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 alternative Lake switchyard site be selected.

- ◊ **Transportation and Traffic**. Both the proposed and alternative switchyard 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 switchyard 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 switchyard site will beneficially contribute to the availability of energy resources both within the general area and throughout the southern California area.

- **Alternative No. 6 - "Alternative Case Springs Substation Site."** This alternative substation site, located in the vicinity of the Case Springs Fire Station, is proposed should the preferred Case Springs substation site not be accepted by the United States Department of the Navy – United States Marine Corps for logistical or other reasons.

  The proposed Case Springs substation is located to the east of Case Springs Lake and south of the Case Springs Fire Station, in close proximity to an existing SDG&E transmission ROW and paralleling the northern boundary of the base. The area is designated by the United States Marine Corps (USMC) as "Echo."[138] To the south of the proposed substation site is the "Whiskey/Zulu Impact Area,"[139] often referred to as the "Central Impact Area." North of that impact area and south of the TRD is a designated "mortar firing areas" (MFAs), "artillery firing areas" (AFAs),[140] "live fire and maneuver" (LFAM) areas,[141] and "helicopter terrain flight" (TERF) route.[142] Helicopters use the door gunner ranges located adjacent to Case Springs, which involve firing machine guns into the "Whiskey Impact Area."[143] To the west of the proposed substation is a designated "drop zone."[144] Although no such determination has yet to be made, as a result of the proximity of these USMC facilities and training operations, the USMC may conclude that the Case Springs substation's proposed placement interferes with existing military training operations or other planned uses for that site. The Site is shown in figure 6.2-10 (Alternative Case Springs 500/230/115 kV Substation Site).

  In discussions with USMC personnel, as depicted in Figure 6.2-11 (Alternative Case Springs 500/230/115 kV Substation Site), an approximately 30 acre alternative Case Springs substation site has been identified directly adjacent to the Case Springs Fire Station on Camp Joseph H. Pendleton in unincorporated San Diego County.

[138]/ United States Marine Corps, Integrated Natural Resources Management Plan – Marine Corps Base and Marine Corps Air Station, Camp Pendleton, March 2007, Figure 2-14, p. 2-14.
[139]/ *Ibid*., Figure 2-15, p. 2-14.
[140]/ *Ibid*., Figure 2-16, p. 2-16.
[141]/ *Ibid*., Figure 2-17, p. 2-17.
[142]/ *Ibid*., Figure 2-19, p. 2-20.
[143]/ United States Marine Corps, Integrated Natural Resources Management Plan – Marine Corps Base and Marine Corps Air Station, Camp Pendleton, October 2001, p. 2-23.
[144]/ *Ibid*., Figure 2-5, p. 2-25.

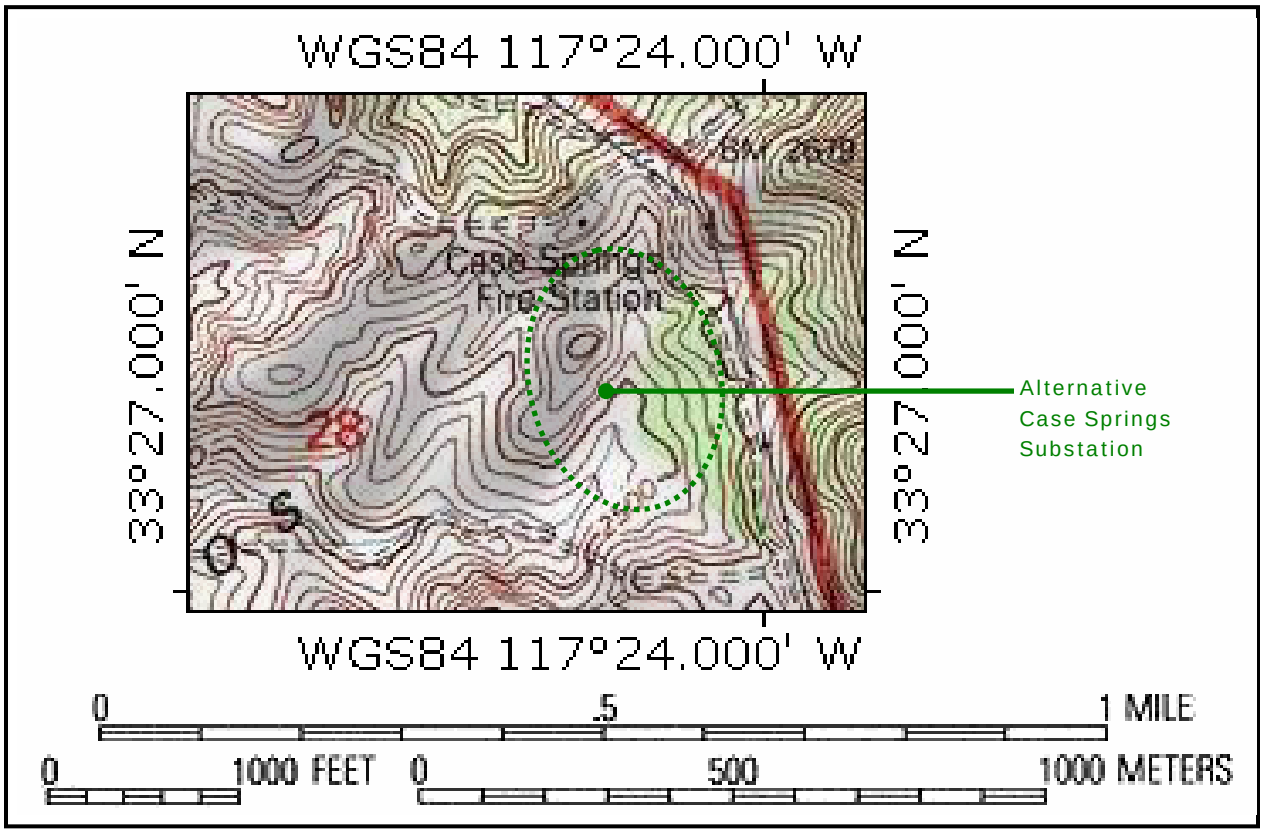


Figure 6.2-10
Alternative Case Springs 500/230/115 kV Substation Site
Source: The Nevada Hydro Company, Inc.

This alternative site, if selected, provides a greater separation distance from the substation to critical military training facilities, including TERF. Should the USMC subsequent determine that this alternative site reduces potential impacts on military training operations, the Applicant needs to retain this alternative site in the upcoming CEQA documentation.

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the Applicant's Project. Only those topical areas where environmental impacts may differ from those associated with the Applicant's Project are discussed below.

◊ **Aesthetics**. The two substation sites exist in an isolated corner of Camp Pendleton, adjacent to a remote corner of the TRD. Development will, nonetheless result in the conversion of a vacant property, containing mostly invasive grasslands and a limited number of oak trees, from a naturally appearing landscape to an industrial-type land use. Although the site's conversion constitutes a substantial physical change, with the exception of on-base military personnel, no large number of viewers will be able to see this Project site.

◊ **Agricultural Resources**. Since neither the proposed nor the alternative Lake substation sites are presently used for any agricultural or farm-related use, the impacts on agricultural resources would be generally comparable.

◊ **Air Quality**. During construction, the quantity of construction-term criteria emissions would not be expected to differ substantially between the two alternative substation sites. Because of the substation site is relatively small, grading and associated construction activities would not be expected to result in an exceedance of the San Diego Air Pollution Control District (SDAPCD) recommended threshold criteria. No sensitive receptors exist in close proximity to either substation site.

Based on the presence of near-site military operations, independent of the site selected, the substation would be developed as a GIS facility. Sulfur hexafluoride (SF_6), a non-toxic and non-flammable gas, is used for the insulation of GIS technology. Sulfur hexafluoride has been identified as a greenhouse gas.

◊ **Biological Resources**. The Case Springs substation is located south of the existing Case Springs Fire Station in the eastern portion of the Camp Pendleton Marine Base. This Project site is located west of the main access road that runs parallel to the eastern limits of the base. The vegetation is dominated by non-native grasslands within several areas that were recently cleared for fire breaks and a small sparse stand of oak trees with a non-native grassland understory. The vegetation community is moderate in quality due to lack of consistent human disturbance. This area is not within the western Riverside County MSHCP.

The Case Springs substation alternative is dominated by non-native grasslands with a few native grasses and forbs. There are no sensitive plant or wildlife

species recorded to occur within this area and no sensitive plant or wildlife species were observed during focused surveys during the 2008 field season.

This area contains suitable habitat for several ground-nesting and tree nesting birds, which will require a nesting bird survey if construction related activities are to occur on the alternative substation site during the nesting period.

The alternative substation footprint contains areas that meet the criteria to be considered waters of the State and waters of the United States. These areas have been evaluated and area included in the 2008 jurisdictional delineation report. Based on current conditions 2.03 acres of non-wetlands jurisdictional areas would be impacted and 0.06 acres of wetlands.

◊ **Cultural Resources**. No cultural resources have been identified or are suspected to occur on the alternative substation site. Additional cultural resource surveys will, however, be conducted prior to any site disturbance.

◊ **Geology and Soils**. In general, Camp Pendleton 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.

No Alquist-Priolo Earthquake Hazard Maps have been prepared for the USGS 7.5-Minute Margarita Peak quadrangle. That topographic quadrangle, however, does not reveal the presence of any fault traces in the general area of the two substations.

Prior to the commencement of any grading activities in the vicinity of the two substation sites, subject to USMC authorization, a detailed geotechnical investigation will be required to identify appropriate grading and design parameters for the selected substation.

◊ **Hazards and Hazardous Materials**. Because of their location within an active military reservation, both substation sites could pose hazards to military personal and operations unless sited and operated in accordance with USMC use authorization. Numerous non-military uses presently exist on Camp Pendleton, demonstrating that permitted uses can effectively co-exist with base operations.

Neither the proposed substation nor the alternative substation will, therefore, 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 on the two sites 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 these substation sites will not result in the release or hazardous materials within

one-quarter mile of an existing or proposed school site and neither substation site is located on a property included on a list of hazardous material sites.

◊ **Hydrology and Water Quality**. The proposed and alternative Case Springs substation is located within the jurisdiction of the Regional Water Quality Control Board, San Diego Region; however, because the Applicant's Project is multi-jurisdiction, is subject to the jurisdiction of the State Regional Water Quality Control Board. The two substation sites are located within the San Onofre Creek watershed (Basin No. 901.50). Hydrologic and water quality impacts from the two substations would be generally comparable.

◊ **Land Use and Planning**. Because both substation sites are located on Camp Pendleton, consultation with the Department of the Navy (DON) and USMC is required and a use authorization will need to be obtained from those agencies. Airspace above the substation sites is designated as "Restrictive Airspace R-2503B." Additionally, because the two substation sites are located in proximity to a number of USMC-designated "live fire and maneuver" (LFAM), "artillery firing areas" (AFAs), and "mortar firing areas" (MFAs), additional siting constraints exist with regards to existing land uses. The Applicant is currently in the process of obtaining site clearance from the USMC.

◊ **Mineral Resources**. Neither site contains recoverable mineral resources.

◊ **Noise**. The construction and operation of the two substation sites would have a generally comparable noise impacts. Noise impacts would generally be limited to the construction term.

◊ **Population and Housing**. The two alternative substation sites would have a generally comparable impact upon population and housing.

◊ **Public Services**. The substation sites are located in close proximity to the Case Springs Fire Station, a jointly operated USFS and USMC facility. The two alternative substation sites would have a generally comparable impact upon police, fire protection, and vector control services.

◊ **Recreation**. West of the proposed substation site, undeveloped recreational campsites are available in the Case Springs area.[145] Neither substation site is designated for nor extensively used for any form of recreation.

◊ **Transportation and Traffic**. Vehicular access to the two substation sites can be obtained, via dirt roads, through both the TRD (via a locked gate) and Camp Pendleton (subject to USMC authorization). Access through Camp Pendleton can, however, be disrupted when military operations are being conducted within specified areas.

[145]/ *Op. Cit*., Integrated Natural Resources Management Plan – Marine Corps Base and Marine Corps Air Station, Camp Pendleton, p. 5-12.

◊ **Utilities and Service Systems**. Water and electrical services are available near this Project site. Station power will be generated at the substation.

◊ **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.

- **Alternative No. 7 - "Santa Rosa-GIL Transition Station Underground."** Under this alternative, an additional portion of the overhead 500 kV transmission line, extending from the proposed Santa Rosa substation to the OHL-GIL transition tower would be placed underground. The undergrounding of this transmission line segment is proposed in response to the potential significant aesthetic impact resulting from the construction of that line segment above ground on steel lattice towers.[146,147] That transmission line segment is located in relative close proximity to the urbanized areas around Lake Elsinore and may be perceptible from a large number of public and private vantage points.

  During Phase 1 (TE/VS Interconnect) activities, as mitigation for impacts upon recreational users, FERC and the USFS have stipulated that only an approximately 1.7 mile segment of the 500 kV transmission line, located near the ridgeline extending pass the two primary hang glider launch sites ("E" and "Edwards" Launch Sites), be placed underground. Various construction options, including cut-and-cover, are available for the construction of that line segment. Because of slope gradient, construction equipment, allowing for cut-and-cover operations, cannot readily access that segment of the transmission line extending uphill from the Santa Rosa substation. Similarly, hand trenching is not believed to be a viable option because of the difficulty of pedestrian access, the absence of spoil disposal sites, the resulting impacts to native vegetation, and for aesthetic reasons. During Phase 2 (LEAPS) activities, boring and/or hard-rock mining operations will be conducted during the construction of the powerhouse and penstocks. An additional "dry tunnel" could be constructed at that time to underground the Santa Rosa-GIL transition station line segment. Deferring undergrounding of this line segment until Phase 2 (LEAPS) allows opportunities for cost efficiencies that would not exist during Phase 1 (TE/VS Interconnect) construction.

  The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the Applicant's Project. Only those topical areas where environmental impacts may differ from those associated with the Applicant's Project are discussed below.

[146]/ This line segment had not been previously identified as being erected above ground. Its present representation as an overhead line (OHL), rather than a gas-insulated line (GIL), is the result of the Applicant's subsequent assessment of the cost and difficulty of undergrounding that facility prior to the initiation of detailed tunneling and hard-rock mining operations that would occur later in time and associated with Phase 2 (LEAPS) activities. Since the costs of the TE/VS Interconnect would be added to the TAC, unless otherwise directed by the CPUC as environmental mitigation, because this line segment can effectively operate as an overhead facility at a lower cost than would be required if constructed as an underground facility, the added costs of undergrounding could be construed as an unnecessary burden on California's ratepayers.

[147]/ Monopole towers could be utilized in lieu of steel lattice towers; however, in recognition of the greater transparence provided by lattice towers and the backdrop of the Elsinore Mountains from most public and private vantage points (i.e., viewers looking upslope toward the towers), lattice towers have been identified by the Applicant as less visually intrusive than monopoles and, therefore, resulting in lesser visual impacts.

◊ **Aesthetics**. When evaluating high-voltage overhead power lines, aesthetics is often identified as a significant environmental impact. The significance of aesthetic impacts is typically deemed to increase when the transmission lines are placed in the fore-ground, on a dominant ridgeline, when constructed of specular (reflective) material, or when accompanied by substantial landform alterations to accommodate tower footings and to vehicular access. Impacts are typically deemed to diminish when towers are placed in the middle-ground or in the back-ground of a landscape setting, when constructed with nonspecular (non-reflective) material, when separation distance between the tower and the viewer increases, and when powers possess some transparency (such as through the use of a lattice tower assembly). Visual impacts can be substantially reduced when transmission lines are placed underground. Even when placed underground, some visual impacts will remain because transition stations are still required at the OHL-GIL transition points.

Undergrounding the Santa Rosa-GIL transition station segment of the 500 kV transmission line would substantially reduce the visual impacts associated with the overhead placement of that line.

◊ **Recreation**. As defined in Section 831.7 of the California Government Code (CGC), a "hazardous recreational activity" (HRA) is defined as a recreational activity conducted on the property of a public entity that creates a substantial risk of injury to a participant or spectator. Certain activities are specifically designated as HRAs, including animal riding (including equestrian competition), archery, bicycle racing or jumping, mountain bicycling, boating, canoeing, diving, hang gliding, hiking, kayaking, motorized vehicle racing, off-road motorcycling or four-wheel driving of any kind, orienteering, pistol and rifle shooting, rock climbing, rocketeering, rodeo, spelunking, sky diving, sport parachuting, paragliding, body contact sports, skateboarding, inline skating, roller hockey, surfing, trampolining, tree climbing, tree rope swinging, waterskiing, white water rafting, and windsurfing. As noted, hang gliding and paragliding are expressly identified by the State as HRAs.

Operating under a USFS-issued annual special use permit, the Elsinore Hang Gliding Association (EHGA) maintains two hang gliding launch sites along South Main Divide Truck Trail. One site ("E" Launch Site) is located in the vicinity of Decker Canyon and, as a result of the undergrounding of an approximately 1.7 mile segment of the 500 kV transmission line, have a relatively unobstructed flight path to a landing site at the alternative Ortega Oaks powerhouse site. The EHGA's right to use that landing site is the subject of unrelated litigation between the EHGA and the property owner.

The second launch site ("Edwards" Launch Site) is located to the south and east of the GIL transition station associated with this line segment. Hang gliders might have a somewhat impeded flight path between the "Edwards" Launch Site and the alternative Ortega Oaks powerhouse site. Representatives of the EHGA have indicated that the athletic fields located at the Butterfield Elementary Visual and Performing Arts Magnet School provides an "emergency" landing site for

hand gliders launching from the TRD. The overhead Santa Rosa-GIL transition would likely impede access to that landing zone from the "Edwards" Launch Site. Construction of an overhead line would logically necessitate the temporary closure of or cessation of launching from the "Edwards" Launch Site. Since the USFS has retained the right to suspend or terminate the EHGA's existing SUP, such actions could be implemented under the existing use agreement.

Placing this line segment underground would allow for the continuance of hang gliding and paragliding operations at relatively the same safety level as now exists in the general area.

◊ **Public Safety**. Placement of the Santa Rosa-GIL transition station line underground would reduce potential public safety hazards to hang gliders and paragliders operating in the vicinity of that transmission line.

▪ **Alternative No. 8 - "Alternative TL Underground Technologies."**[148] Although the Applicant is initially proposing a high-pressure, gas-insulated transmission line (GIL) system for that segment of the proposed 500 kV transmission line to be constructed underground, other underground technologies and design options may be available and may be implemented in lieu of the GIL system, including solid dielectric (cross-linked polyethylene) (XLPE), high-pressure fluid-filled (HPFF), and self-contained fluid-filled (SCFF). 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 another type of underground transmission system. Each 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, a 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 insulting pressurized fluid. The three cables per

[148]/ 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).

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 aluminum 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.

In the aforementioned alternative, a additional switchyard (Transition Switchyard) has to be build at the 500KV overhead line – cable transition point linking the Santa Rosa Substation. Figures 6.2-11

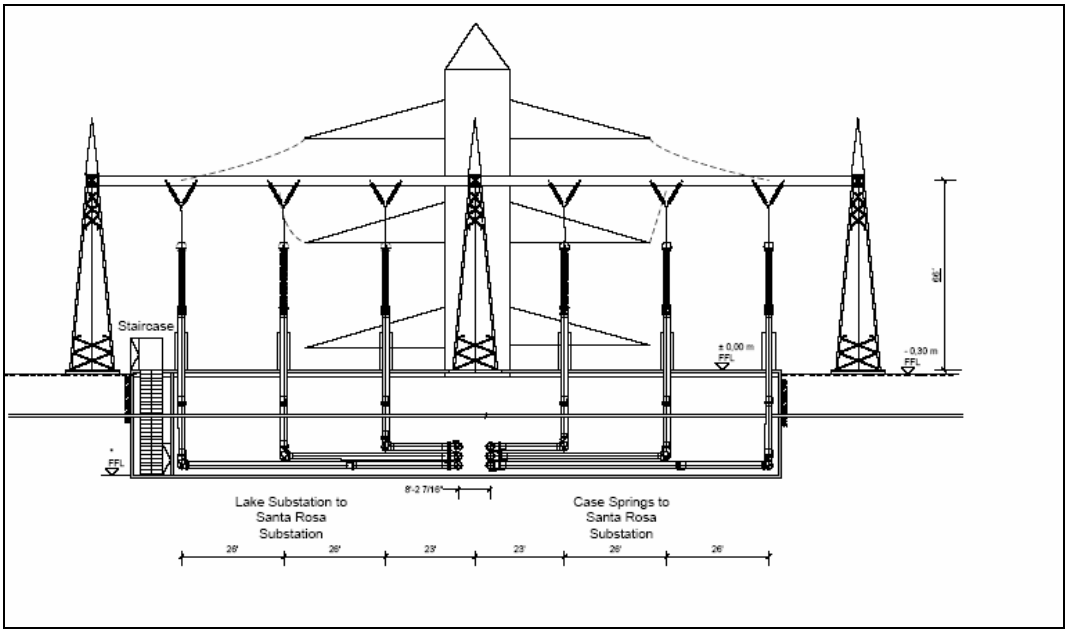


Figure 6.2-11 Alternative 8 Elevation (1 of 2)

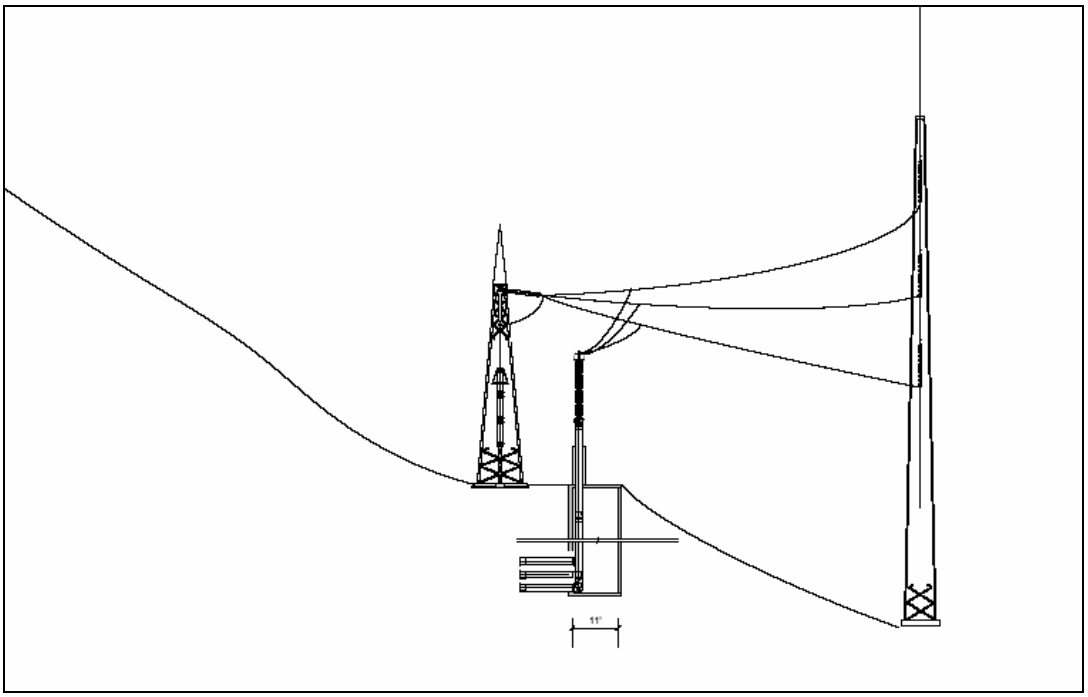


Figure 6.2-11 Alternative 8 Elevation (2 of 2)

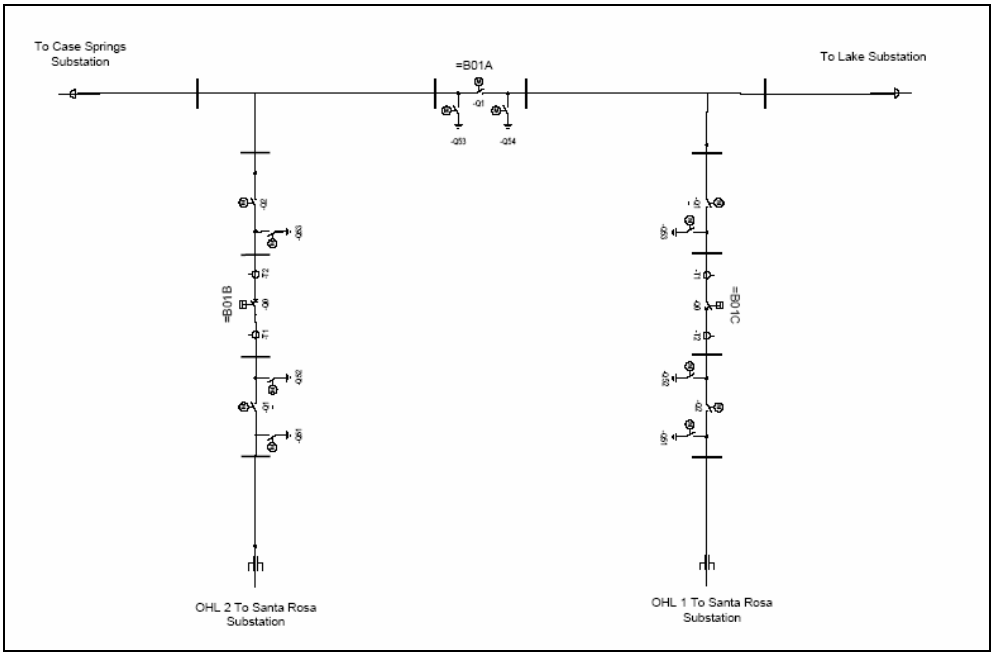


Figure 6.2-12 Alternative 8 Single Line Diagram

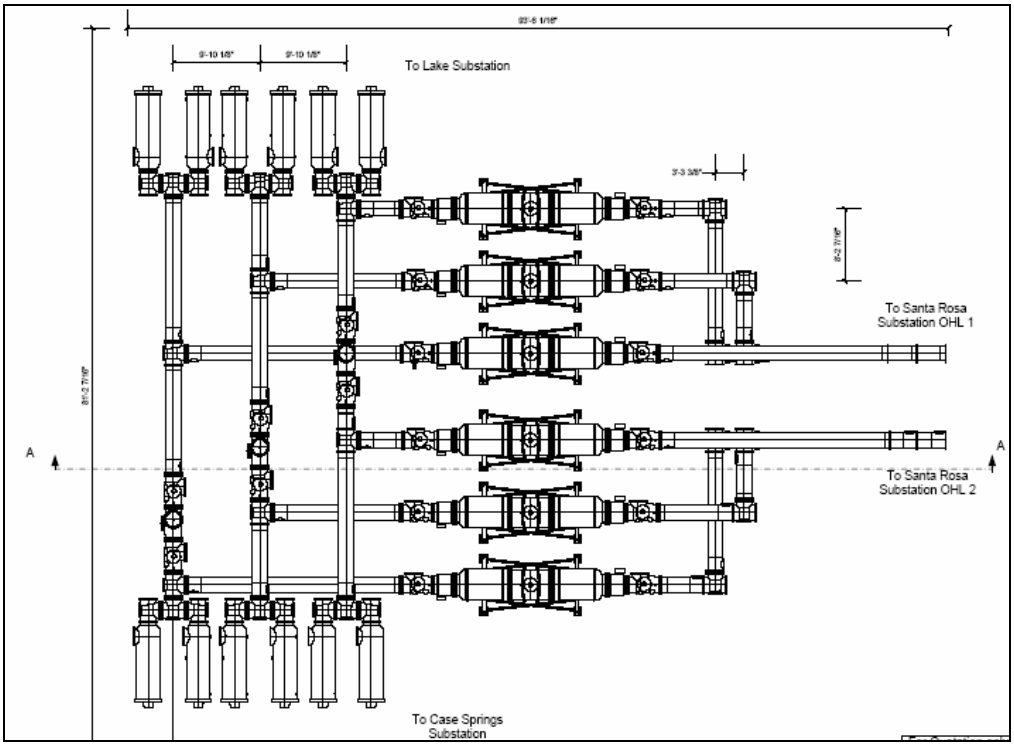


Figure 6.2-13 Alternative 8 Plan View

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."[149]

To the extend that any of these other underground line technologies would allow for a reduction in the area of ground disturbance, the impacts of that alternative's selection would likely be a lessening of Project-related biological impacts.

6.2.4.4 Alternative No. 9 - "New Non-Wires In-Area Renewable Generation"

This alternative, as identified and described in the Sunrise DEIR/DEIS (Section E.5), constitutes a distinct and substantially different means of meeting many of the Project's stated objectives that through the implementation of the Applicant's Project. As described therein, this alternative would involve the development of various in-area renewable projects (i.e., solar, wind, and biomass/biogas) that together could provide sufficient generation capacity within the San Diego load center to defer the need for the Applicant's Project.

[149]/ 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.

Assuming, for the purpose of this alternatives analysis, that generation and pumped storage are reasonably synonymous, although LEAPS provides an opportunity for new in-area renewable generation, it is assumed that the "New Non-Wires In-Area Renewable Generation" alternative is or can be interpreted as being separate and distinct from LEAPS. As described in the Sunrise DEIR/DEIS: "The renewable technologies addressed in this section are considered as 'non-wires alternatives' because they offer alternatives. . .that do not include, as their primary component, construction of a transmission line."[150] While the TE/VS Interconnect can serve, in whole or in part, the combined role of a network upgrade and a generation-interconnect, the transmission portion of the Applicant's Project is neither the "primary component" of LEAPS nor of the "whole of the action" examined throughout this PEA. As such, the Applicant's Project is itself a variation of the "New Non-Wires In-Area Renewable Generation" alternative.

In order to distinguish this alternative from the Applicant's Project, presented in Table 6.2-3 (Capacity Added by the New Non-Wires In-Area Renewable Generation Alternative) is the mix of new renewable resources that would be developed (by others) in San Diego County under this alternative. As indicated in the Sunrise DEIR/DEIS, this capacity distribution is based on an energy planning assessment proportional to renewable availability in San Diego County.

Table 6.2-3 Capacity Added by the New Non-Wires In-Area Renewable Generation Alternative

In-Area Renewable Resource	Nameplate Capacity Added	Incremental Firm On-Peak Capacity
Solar Thermal	290	232
Solar Photovoltaic	210	105
Wind	400	96
Biomass/Biogas	100	100
Total	1,000 MW	533 MW

Source: California Public Utilities Commission

As indicated in the Sunrise DEIR/DEIS, the solar thermal component of the "New Non-Wires In-Area Renewable Generation" alternative would include large-scale solar thermal energy development in the Borrego Springs area.[151] However, "no developers have identified sites in Borrego Springs for such a large solar thermal project"[152] The solar photovoltaic component of this alternative would be dispersed throughout the SDG&E service territory; however, no "specific installation locations have not been identified."[153]

In addition to those installations which are already likely to occur under the California Solar Initiative, the implementation of this alternative's photovoltaic component would require the installation of "approximately 20,000 residential systems and 85 commercial systems per year during the three year period, 2008-2010."[154] Clearly, the accomplishment of that goal would necessitate an aggressive implementation program.

[150]/ *Op. Cit*., 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, p. E.5-1.
[151]/ As indicated in the Sunrise DEIR/DEIS, one of the "options" associated with this solar plant component would necessitate the construction of a new 36.5 mile transmission line (p. E.5-6), a length which is substantially longer than the new transmission line associated with the proposed project.
[152]/ *Op. Cit*., 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, p. E.5-2.
[153]/ *Ibid*., p. E.5-12.
[154]/ *Ibid*., p. E.5-12.

With regards to biomass/biogas, one potential location is identified as the Fallbrook Renewable Energy Project. As indicated in the Sunrise DEIR/DEIS: "Envirepel, Inc. would be the facility owner and as of this printing had yet to submit an Application for Certification to the California Energy Commission for project approval."[155] From this information, since this alternative calls for implementation by others, the Applicant cannot attest to the feasibility of this alternative.

As indicated in the Sunrise DEIR/DEIS, the large-scale solar thermal energy development in the Borrego Springs area would not be projected to come on line until 2016,[156] representing an in-service date substantially longer than the Applicant's Project.

Other than the analysis presented in the Sunrise DEIR/DEIS, the Applicant does not possess independent material allowing for a further analysis of this alternative. As indicated in the Sunrise DEIR/DEIS, based on the assumptions presented therein and assuming that the document's conclusions would remain reasonably applicable to the Applicant's Project: "This alternative would still create significant impacts as a result of the extensive ground disturbance, habitat loss, and visibility of the large wind and solar thermal components. The solar thermal component would have significant visual and recreation impacts due to its location in the Borrego Valley, highly visible from surrounding Anza-Borrego Wilderness areas. Also, the solar thermal component would require transmission line upgrades through the [Anza-Borrego] Park, but they would be installed underground within paved roads. While these significant and unmitigable impacts would occur, the impacts would be largely confined to specific areas (except for transmission connections), rather than along an extended linear path. This alternative also greatly reduces the impacts of fire due to overhead obstacles (using the option in which the solar thermal transmission line would be underground)."[157]

The closure of older gas-fired power plants is not be expected to occur under this alternative.[158]

6.2.4.5 Alternative No. 10 - "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 generally reflects the conditions and associated environmental impacts that would predictably occur should the Applicant's Project be denied by regulators or should the Project's regulators fail to take affirmative action on the proposed development plan, resulting in, the retention of the Project's facility sites in their existing conditions.

Should the Applicant's Project or an alternative not be approved, the regional need for new generation and transmission 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, or other efforts to increase supply or reduce demand would have regional environmental and economic consequences (e.g., increased potential for blackouts).[159] Those

[155]/ *Ibid*., p. E.5-14.
[156]/ *Ibid*., p. C-75.
[157]/ *Ibid*., p. ES-65.
[158]/ *Ibid*., p. H-137.
[159]/ As indicated by SDG&E, speaking with regards to their proposed SRPL project: "In the unfortunate event that the proposed project cannot be in place by the summer of 2010, at least 247 MW of in-basin generation or increased import capability would be needed to satisfy the identified reliability deficiency. This deficiency grows over time (reaching 835 MW by year 2020). In response to this growing deficiency, SDG&E must

regional consequences are not addressed herein; rather, the "no project/no build" alternative focuses on the localized implications with regards to the individual Project's facility 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 Project not be implemented. Regional energy shortfalls can be anticipated beginning in 2010 but are not direct consequences of the "no project/no build" alternative.

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the Applicant's Project. Although each of the Project's facility sites are assumed to be retained in their current conditions, additional area wide development is assumed in a manner consistent with agency projections and other related projects, as located within the generalized geographic scope of cumulative impacts, would continue to occur. Related projects are assumed to include the development of the Ortega Oaks powerhouse site for residential use (Tract Map Nos. 22626 and 22626-1). In addition, under the "no project/no build" alternative, any positive impacts associated with the Applicant's 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 Project would be avoided. Localized and other area wide 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 reduction in area wide open space areas.

- **Agricultural Resources**. Independent of the development of the Applicant's Project or the retention of those of the alternative facility sites in their current conditions, because area wide 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) continued to be classified as non-attainment for a number of criteria pollutants, including ozone and inhalable particulate mater. As a result, since area wide development will continue to occur under this alternative, air quality impacts will remain cumulatively significant.

implement alternative schemes to meet the San Diego area reliability requirement. Certain new in-area generation options may be feasible. It might be possible to install enough new gas turbines to meet the San Diego area local reliability requirement for a few years. SDG&E, on behalf of its bundled customers, has issued a Request for Offer to see if additional peaking capacity can be economically added to the service territory by the summer of 2008. Assuming no other local plants retire, this additional peaking capacity would meet part of the identified need beginning in year 2010. SDG&E has also identified in its resource plan filed in R.06-02-013, a resource need starting in 2010 for additional capacity to meet bundled customer needs. A portion of this capacity may need to be in the form of new in-area generation if the Sunrise Powerlink is delayed. However, over the longer term it is impractical and inefficient to build enough gas turbines to satisfy the San Diego area reliability requirement, even without considering the obvious consequences for air quality. Even the most efficient gas turbines emit significant amounts of particulate matter (PM), sulfur dioxide (SO2), nitrogen oxides (NOx), carbon monoxide (CO) and volatile organic compounds (VOC). Case 200, SDG&E's gas-turbine reference case, requires 18 gas turbines each sized 46.6 MW to meet local reliability requirements in year 2020" (Source: San Diego Gas & Electric, Chapter VII – Supplemental Testimony, A.06-08-010, January 26, 2007, pp. 55-56).

- **Biological Resources**. Predicted area wide 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 Project or the retention of the Project's facility sites and alternative facility sites in their current conditions, the long-term, area wide 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 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 for any Project-related use, no significant mineral resource impacts would occur.

- **Noise**. Under the "no project/no build" alternative, none of the Project's facility sites and none of the alternative sites would be developed for the proposed uses. Any proximal sensitive receptors would, therefore, not be subjected to either construction-term or operational noise attributable to the Applicant's 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 area wide and related projects development.

- **Public Services**. 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 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 for any Project-related use, no significant recreational impacts would be projected to occur.

- **Transportation and Traffic**. 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 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 for any Project-related use, 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 for any Project-related use, no significant energy resource impacts would be expected to occur.

6.3 Growth-Inducing Impacts

The directions provided by CPUC for this section (6.3) are the same as those provided by CPUC for section 5.18, above. Therefore see section 5.18 for a discussion and analysis of growth-inducing impacts.