CALICO SOLAR POWER PROJECT

Presiding Member's Proposed Decision

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CALIFORNIA
ENERGY COMMISSION
Arnold Schwarzenegger, Governor

DOCKET NUMBER 08-AFC-13

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DISCLAIMER

This report was prepared by the California Energy Commission Calico Solar Project AFC Committee as part of Calico Solar Project, Docket No. 08-AFC-13. The views and recommendations contained in this document are not official policy of the Energy Commission until the report is adopted at an Energy Commission Business Meeting.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
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The Committee hereby submits its Presiding Member's Proposed Decision for the ***CALICO SOLAR PROJECT*** (Docket Number 08-AFC-13). We have prepared this document pursuant to the requirements set forth in the Commission's regulations. (20 Cal. Code Regs., §§ 1749-1752.5.)

The Committee recommends that the Application for Certification be approved, subject to the Conditions of Certification set forth herein, and that the Energy Commission grant the Project Owner a license to construct and operate the Project.

Dated: September 25, 2010, at Sacramento, California.

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Commissioner and Presiding Member
Calico Solar AFC Committee

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INTRODUCTION

A. SUMMARY OF THE DECISION

This Decision contains the Commission's rationale for determining to approve a license for the proposed Calico Solar Project (CSP) in the modified "Scenario 5.5" format proposed by the Applicant in September, 2010. While many of the potentially significant environmental impacts of the CSP will be mitigated to insignificant levels by design changes and measures required in the Conditions of Certification, significant, unmitigated impacts remain. The nature of those impacts are described in the relevant topic sections and summarized, along with the Commission's rationale for determining that the benefits of the project outweigh or override those impacts, in the Override Findings section near the end of this Decision. In the remainder of this Decision we also find that the CSP will comply with all applicable laws, ordinances, regulations, and standards (LORS). Our Decision is based exclusively upon the record established during this certification proceeding and summarized in this document. We have independently evaluated the evidence, provided references to the record[1] supporting our findings and conclusions, and specified the measures required to ensure that the Calico Solar Project is designed, constructed, and operated in the manner necessary to protect public health and safety, promote the general welfare, and preserve environmental quality.

On December 1, 2008, Stirling Energy Systems (SES) Solar Three, LLC and Stirling Energy Systems Solar Six, LLC (Applicant), submitted an Application for Certification (AFC) to the Energy Commission to construct a concentrated solar thermal power plant facility approximately 37 miles east of Barstow, in San Bernardino County. At the May 6, 2009, Business Meeting, the Energy Commission deemed the project adequate beginning staff's analysis of the proposed project. The Energy Commission has exclusive jurisdiction to license this project and is considering the proposal under a review process established by Public Resources Code section 25540.6.

The proposed project will be constructed on an approximate 4,613-acre site located in San Bernardino County, California. The project site is approximately 37 miles east of Barstow, 17 miles east of Newberry Springs, 57 miles northeast

[1] The Reporter's Transcript of the evidentiary hearings is cited as "date of hearing RT page __." For example: 9/20/10 RT 77. The exhibits included in the evidentiary record are cited as "Ex. number." A list of all exhibits is contained in **Appendix B** of this Decision.

of Victorville, and approximately 115 miles east of Los Angeles (straight line distances). The Applicant has applied for a Right of Way (ROW) grant from the United States Bureau of Land Management (BLM) to construct and operate the CSP on BLM-managed public lands. CSP will use approximately 32 acre feet of water per year, produce a nominal 663.5 MW of electricity, and operate for a term of 40 years. The project is proposed for development in two phases. Phase I is located on approximately 1,876 acres. Phase II is located on approximately 2,737 additional acres. About 26,450 SunCatchers, configured in 442 1.5 MW groups of 60 SunCatchers will be constructed on the project site.

Project construction is planned to begin in late 2010. Although construction would take approximately 44 months to complete, power would be available to the grid as each 60-unit group of SunCatchers is completed. It is expected that the Project would be operated with a staff of approximately 182 full-time employees. The project would operate 7 days per week, generating electricity during normal daylight hours when the solar energy is available. Construction activities will employ an average of 400 workers a month, peaking at 700 workers per month, for an approximately four-year construction period.

B. SITE CERTIFICATION PROCESS

The Calico Solar Project and its related facilities are subject to Energy Commission licensing jurisdiction. (Pub. Res. Code, § 25500 et seq.). During licensing proceedings, the Commission acts as lead state agency under the California Environmental Quality Act (CEQA). (Pub. Res. Code, §§ 25519(c), 21000 et seq.) The Commission's regulatory process, including the evidentiary record and associated analyses, is functionally equivalent to the preparation of an Environmental Impact Report. (Pub. Res. Code, § 21080.5.) The process is designed to complete the review within a specified time period when the required information is submitted in a timely manner; a license issued by the Commission is in lieu of other state and local permits.

The Commission's certification process provides a thorough review and analysis of all aspects of a proposed power plant project. During this process, the Energy Commission conducts a comprehensive examination of a project's potential economic, public health and safety, reliability, engineering, and environmental ramifications.

Specifically, the Commission's process allows for and encourages public participation so that members of the public may become involved either informally or on a formal level as intervenor parties who have the opportunity to

present evidence and cross-examine witnesses. Public participation is encouraged at every stage of the process.

The process begins when an Applicant submits an AFC. Commission staff reviews the data submitted as part of the AFC and makes a recommendation to the Commission on whether the AFC contains adequate information to begin the certification process. After the Commission determines an AFC contains sufficient analytic information, it appoints a Committee of two Commissioners to conduct the formal licensing process. This process includes public conferences and evidentiary hearings, where the evidentiary record is developed and becomes the basis for the Presiding Member's Proposed Decision (PMPD). The PMPD determines a project's environmental impact and conformity with applicable laws, ordinances, regulations, and standards and provides recommendations to the full Commission.

The initial portion of the certification process is weighted heavily toward assuring public awareness of the proposed Project and obtaining necessary technical information. During this time, the Commission staff sponsors public workshops at which intervenors, agency representatives, and members of the public meet with Staff and Applicant to discuss, clarify, and negotiate pertinent issues. Staff publishes its initial technical evaluation of the Project in its Preliminary Staff Assessment (PSA), which is made available for a 30-day public comment period. Staff's responses to public comment on the PSA and its complete analyses and recommendations are published in the Final Staff Assessment (FSA, also Exhibit 300).

Following this, the Committee conducts a Prehearing Conference to assess the adequacy of available information, identify issues, and determine the positions of the parties. Based on information presented at this event, the Committee issues a Hearing Order to schedule formal evidentiary hearings. At the evidentiary hearings, all formal parties, including intervenors, may present sworn testimony, which is subject to cross-examination by other parties and questioning by the Committee. Members of the public may offer oral or written comments at these hearings. Evidence submitted at the hearings provides the basis for the Committee's analysis and recommendations to the full Commission.

The Committee's analysis and recommendations appear in the PMPD, which is available for a 30-day public comment period. Depending upon the extent of revisions necessary after considering comments received during this period, the Committee may elect to publish a revised version. If so, the Revised PMPD

triggers an additional public comment period. Finally, the full Commission decides whether to accept, reject, or modify the Committee's recommendations at a public hearing.

Throughout the licensing process, members of the Committee, and ultimately the Commission, serve as fact-finders and decision-makers. Other parties, including the Applicant, Commission staff, and formal intervenors, function independently with equal legal status. An "ex parte" rule prohibits parties in the case, or other persons with an interest in the case, from communicating on substantive matters with the decision-makers, their staffs, or assigned hearing officer unless these communications are made on the public record. The Office of the Public Adviser is available to assist the public in participating in all aspects of the certification proceeding.

C. PROCEDURAL HISTORY

Public Resources Code, sections 25500 et seq. and Energy Commission regulations (Cal. Code Regs., tit. 20, § 1701, et seq.) mandate a public review process and specify the occurrence of certain procedural events in which the public may participate. The key procedural events that occurred in the present case are summarized below.

On December 2, 2008, Stirling Energy Systems Solar One, LLC (SES Solar Three LLC and SES Solar Six LLC) submitted an Application for Certification (AFC) to construct and operate the Stirling Energy Systems Solar One Project (SES Solar One), a solar dish Stirling systems project in San Bernardino County, California. In January 2010, the project formally changed its name to the **Calico Solar Project**. The Applicant, SES Solar Three LLC, was merged into SES Solar Six LLC, and that surviving entity was re-named Calico Solar, LLC.

At the May 6, 2009, Business Meeting, the Energy Commission deemed the project adequate, beginning staff's analysis of the proposed project. The Energy Commission assigned a Committee of two Commissioners to conduct proceedings.

The formal parties included the Applicant, the Energy Commission staff (Staff), and Intervenors: California Unions for Reliable Energy (CURE); County of San Bernardino; Defenders of Wildlife; Basin and Range Watch; Society for the Conservation of Bighorn Sheep; The Sierra Club; Patrick C. Jackson; Newberry Community Service District; and the Burlington Northern Santa Fe Corporation.

On May 28, 2009, the Committee issued a Notice of Informational Hearing and Public Site Visit and Bureau of Land Management Scoping Meeting. The Notice was mailed to local agencies and members of the community who were known to be interested in the project, including any owners of land adjacent to or in the vicinity of the Calico Solar Project. The Public Adviser's Office also advertised the public hearing and site visit and distributed information to local officials and sensitive receptors surrounding the project site.[2]

On June 22, 2009, the Committee conducted a Site Visit to tour the proposed Calico site and then convened a public Informational Hearing at the Barstow Community College, Performing Arts Center, in Barstow, CA. At that event, the Committee, the parties, interested governmental agencies, and other public participants discussed issues related to development of the project, described the Commission's review process, and explained opportunities for public participation.

On July 29, 2009, the Committee issued an initial Scheduling Order. The Committee Schedule was based on both Applicant and Staff's proposed schedules and related discussion at the Informational Hearing. On November 24, 2009, and February 2, 2010, the Committee issued Revised Committee Scheduling Orders.

The Energy Commission's CEQA-equivalent process and the BLM's National Environmental Policy Act (NEPA) process provided opportunities for the public and other agencies to participate and consult in the scoping of the environmental analysis of this proposed project, and in the evaluation of the technical analyses and conclusions of that analysis. The Energy Commission and BLM typically seek comments from and work closely with other regulatory agencies that administer LORS that may be applicable to a proposed project. The agencies coordinating through this joint Staff Assessment/Environmental Impact Statement (SA/EIS) process for the proposed Calico Solar Project are the United States Army Corp of Engineers, the U.S. Fish and Wildlife Service, State Water Resources Control Board/Regional Water Quality Control Board, California Department of Fish and Game, and San Bernardino County.

[2] Sensitive receptors are people or institutions with people that are particularly susceptible to illness, such as the elderly, very young children, people already weakened by illness (e.g., asthmatics), and persons engaged in strenuous exercise.

In the course of the review process, the Energy Commission and BLM have held additional joint Issue Resolution, alternatives identification, and data response workshops which were announced and made available to the public. These workshops were held on September 16, 2009 in Barstow, California, and on December 22, 2009 in Sacramento, California. The purposes of the workshops were to provide members of the community and governmental agencies opportunity to obtain project information, and to offer comments they may have had regarding any aspect of the proposed project.

The SA/DEIS for the Calico Solar Project (08-AFC-13) was published by the Energy Commission on March 30, 2010. The SA/DEIS contained the California Energy Commission staff's and U.S. Bureau of Land Management's (BLM's) environmental, public health and engineering evaluation of the proposed Calico Solar Project. A Supplemental Staff Assessment was published in two parts, the first issued on July 21, 2010, and the second on August 9, 2010.

The Committee conducted a Prehearing Conference on July 30, 2010 and held Evidentiary Hearings on August 4, 5, 6, 18 and 25, 2010. On September 3, 2010, the Committee directed that the parties explore reduced size alternatives to the 6,215 acre proposal that was the subject of the hearings. The applicant presented six proposals, which were reduced to two final proposals after discussion at a September 9, 2010, staff-conducted workshop. Those two proposals, labeled "Scenario 5.5" and "Scenario 6," were the subject of an additional evidentiary hearing on September 20, 2010. Both scenarios significantly reduce the number of desert tortoises likely to be affected by the project.

We note that staff (Ex. 317, p. ES-1) and the applicant (Ex. 114, p. 1 – 4) prefer Scenario 5.5 over Scenario 6 because it would produce more renewable energy power. We treat Scenario 5.5 as the new proposed project for purposes of this Decision.

The Committee published this PMPD, recommending approval of Scenario 5.5, on September 25, 2010, The 30-day comment period on the PMPD will expire on October 25, 2010.

D. COMMISSION OUTREACH

Several entities within the Energy Commission provide various notices concerning power plant siting cases. Staff provides notices of staff workshops and the release of the Preliminary and Final Staff Assessments. The Hearing

Office notices Committee-led events such as the informational hearing and site visit, status conferences, the prehearing conference, and evidentiary hearings. The Public Adviser's Office provides additional outreach for critical events as well as provides information to interested persons that would like to become more actively involved in a power plant siting proceeding. Further, the Media Office provides notice of events to local and regional press through press releases. The public may also subscribe to the proceeding's e-mail List Server offered on the web page for each project which gives an immediate notification of documents posted to the project web page. Through the activities of these entities, the Energy Commission has made every effort to ensure that interested persons are notified of activities in this proceeding.

E. PUBLIC COMMENT

The record contains public comments from concerned individuals and organizations. Throughout these proceedings, as reflected in the transcribed record, the Committee provided an opportunity for public comment at each Committee-sponsored conference and hearing.

I. PROJECT DESCRIPTION

On December 2, 2008, Stirling Engine Systems Solar One, LLC (SES Solar Three, LLC and SES Solar Six, LLC) submitted an Application for Certification (AFC) to the California Energy Commission to construct and operate the Stirling Energy Systems Solar One Project (SES Solar One) on public land managed by the Bureau of Land Management (BLM) in San Bernardino County, California. On May 6, 2009, the Energy Commission accepted the AFC as complete. In January 2010, the project formally changed its name to the Calico Solar Project (CSP). The applicant, SES Solar Three, LLC, was merged into SES Solar Six, LLC, and that surviving entity was re-named Calico Solar, LLC. Calico Solar is a subsidiary of Tessera Solar™. The Calico Solar Project was originally filed as a nominal 850 megawatt (MW) solar thermal power plant. In September, 2010, its proposed output was reduced to 663.5 MW. (Exs. 300, p. B.1-1; 317, p. B.1-2.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Project Location

The Calico Solar Project site is proposed to be located on public land managed by the BLM. The project is proposed for development in two phases, with the first phase further divided into subparts. Phase 1a is located on approximately 250 acres, Phase 1b is 1,626 acres and Phase 2 is 2,737 acres for a combined total of 4,613 acres. (Ex. 114, p. 2)

The Calico Solar Project also includes a new 230-kilovolt (kV) Calico Solar Substation, 2.0 miles of electrical transmission line, an administration building, maintenance complex, onsite routes interior to the project boundaries, a site access road, and a bridge over the Burlington Northern Santa Fe railroad tracks. Approximately 739 feet of the 2-miles of single-circuit, 230-kV generation interconnection transmission line would be constructed off the project site but still on BLM managed land. The transmission line would connect the proposed Calico Solar Substation to the existing Southern California Edison (SCE) Pisgah Substation. (Ex. 300, p. B.1-4.)

2. Project Construction and Operation

The project would be constructed in two phases. Phase 1a would consist of 60 SunCatchers configured in a single group and much of the support facilities. Phase 1b and then Phase 2 would contain the remaining 26,390 SunCatchers

arranged in 1.5-MW solar groups of 60 SunCatchers per group, bringing the CSP to its net nominal generating capacity of 663.5 MW. The Applicant expects that construction would take approximately 44 months to complete. However, power would be available to the grid as each 60-unit group of SunCatchers is completed. (Ex. 114, p. 2; Ex. 300, pp. B.1-7 and B.1-19)

The overall footprint for the CSP, as well as the individual phases are depicted on Project Description Figure 1, below.

Heavy construction for the project would be scheduled to occur between 0700 and 1900 Monday through Friday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities. Some activities would continue 24 hours per day, 7 days per week. These activities include, but are not limited to, SunCatcher assembly, refueling of equipment, staging of materials for the next day's construction activities, quality assurance/control, and commissioning. (Ex. 300, pp. B.1-19 to B.1-20.)

The entire project would be fenced for security, however the design of the fencing is being determined in coordination with regulatory and resource agencies to protect sensitive ecological areas and address storm flows in washes. The project would have a laydown area on 14 acres adjacent to the Main Services Complex. (Ex. 300, p. B.1-8.)

Note: In September, 2010, in response to a Calico Siting Committee order, the Applicant presented two alternative reduced project size proposals for consideration. They were labeled Scenario 5.5 and Scenario 6. Scenario 5.5 is described above and is being considered as the Applicant's substitute proposal. Scenario 6 reduced the project's footprint slightly from Scenario 5.5's 4,613 acres to 4,244 acres, and power output from 663.5 MW to 603.9 MW. The Committee has chosen Scenario 5.5, the Applicant's obvious favorite for its greater output, as the proposal to further analyze and consider for approval. Because not all of the details, such as total roadway length have been provided, some of the information below relates to the larger 850 MW project no longer under consideration. As such, that data overstates the magnitude of the project, as well as its impacts, to a degree.

During project construction and operation, the main access to the project site would be from the south, off of Interstate 40 from the Hector Road exit. The applicant proposed the development of the following roadways on the project site: approximately 25.2 miles of surface-treated roadways, approximately 168 miles of north-south access routes, and approximately 102 miles of east-west access routes. The access routes would be surface-treated to reduce fugitive dust while

allowing full access to all dishes and infrastructure. Polymeric stabilizers will be used in lieu of traditional road construction materials for paved roads and/or to stabilize unpaved roads. All access to the project site would be through controlled gates. (Ex. 300, p. B.1-8.)

It is expected that the CSP would be operated with a staff of approximately 182 full-time employees. The project would operate 7 days per week, generating electricity during normal daylight hours when the solar energy is available. Maintenance activities would occur 7 days a week, 24 hours a day to ensure SunCatcher availability when solar energy is available. (Ex. 300, p. B.1-20.)

The applicant has applied for a right-of-way (ROW) grant for the project site from the BLM Barstow Field Office. Although the project is phased, it is being analyzed as if all phases would be operational at the same time. (Ex. 300, p. B.1-7.)

3. Solar Field, Power Generation Equipment and Process

Project Description Table 1 lists the major equipment and significant structures required for the Calico Solar Project.

Project Description Table 1
Significant Structures and Equipment

Description	Quantity	Length (feet)	Width (feet)	Height (feet)
SunCatcher power generating system	~~34,000~~ **26,450**	38 diameter		40
Main Services Complex administration building	1	60	70	17
Main Services Complex maintenance building	1	70	70	17
Main SunCatcher assembly buildings	3	1,000	100	78
Well water storage tank and Fire Water 230,000 gallons	1	40 diameter		20
Demineralized water tank, 17,000 gallons	2	18 diameter		10
Potable Water Tank, 5,000 gallons	1	40 diameter		20
230kV transmission line towers, double-circuit with upswept arms	12 to 15	--	32	90 to 110
Generator collection sub-panel; distribution panel, 42 circuit, 400A, 600V, with circuit breakers in a weatherproof enclosure	2,834	1	2.67	5
Generator collection power center, 2,000-A distribution panels with six 400-A circuit breakers	567	2	3.33	7.5
Collector group generator step-up unit transformer (GSU), 1,750kVA, 575 V to 34.5kV, with taps	567	6.67	7.5	6.67

Description	Quantity	Length (feet)	Width (feet)	Height (feet)
Power factor correction capacitor, 600V, 1,000kVAR, switched in five, each 200kVAR steps	567	2.5	6.67	7.5
Open bus switch rack, 35kV, 7 bay with five 35kV, 1,200-A, 40kVA INT, circuit breakers, insulators, switches, and bus work	6	105	20	30
Shunt capacitor bank, 34.5kV, 90 MVAR switched in six each 15 MVAR steps	6	15	8	20
Dynamic VAR (DVAR) compensation system in coordination with shunt capacitor banks – size to be determined by studies	1	60	12	16
Disconnect switch, 35kV, 3,000 A, 200kV BIL, group-operated	6	3	11	16
Power transformer, three phase, 100/133/167 mega volt amp, 230/132.8-34.5/19.9kV, 750kV BIL, oil filled	6	15	35	23
Power circuit breaker, 242kV, 2000A, 40 kilo amp interrupting capacity	7	12	20	16
Coupling capacitor voltage transformer for metering, 242kV, 900kV BIL, 60 Hertz, Potential Transformer ratio 1,200/2,000:1	6	1	1	25
Disconnect switch, 242kV, 2000A	9	10	25	25

Source: Ex. 300, p. B.1-9

Notes: A = ampere (amp), BIL = basic impulse level, gpd = gallons per day, HP = horsepower, Hz = hertz, INT = international, kA = kilo amps kV = kilovolt, kVA = kilovolt amps, Kvar = kilovolt amp reactive, kW = kilowatt, kWe = kilowatt-electric, MVA = megavolt amps MVAR = megavolt amp reactive MW = megawatts, V = volts, VAR = volt amp reactive W = watts

The SunCatcher™ is a 25-kilowatt-electrical (kW) solar dish Stirling system designed to automatically track the sun and collect and focus solar energy onto a power conversion unit (PCU), which generates electricity. The system consists of an approximately 40-foot-high and 38-foot in diameter solar concentrator in a dish structure that supports an array of curved glass mirror facets. These mirrors collect and concentrate solar energy onto the solar receiver of the PCU.

The PCU converts the focused solar thermal energy into grid-quality electricity. The conversion process in the PCU involves a closed-cycle, 4-cylinder, 35-horsepower reciprocating Stirling Engine utilizing an internal working fluid of hydrogen gas that is recycled through the engine. The Stirling Engine operates with heat input from the sun that is focused by the SunCatcher's dish assembly mirrors onto the PCU's solar receiver tubes, which contain hydrogen gas. The PCU solar receiver is an external heat exchanger that absorbs the incoming solar thermal energy. This heats and pressurizes the hydrogen gas in the heat exchanger tubing, the gas in turn powers the Stirling Engine.

A generator is connected to the Stirling Engine to produce the electrical output of the SunCatcher. Each generator is capable of producing 25 kW at 575 volts alternating current (VAC)/60 hertz (Hz) of grid-quality electricity when operating with rated solar input. Waste heat from the engine is transferred to the ambient air via a radiator system similar to those used in automobiles.

The hydrogen gas is cooled by a standard glycol-water radiator system and is continually recycled within the engine during the power cycle. The conversion process does not consume water. The only water consumed by the SunCatcher is for washing of the mirrors to remove accumulated dust and replenishing small losses to the cooling system radiator in a 50-50 ethylene glycol-water coolant.

4. Site Grading and Drainage

Brush trimming would be conducted between alternating rows and would consist of cutting the top of the existing brush while leaving the existing native plant root system in place to minimize soil erosion. To minimize shading on SunCatchers and prevent potential brush fire hazards, natural vegetation trimmings would be cleared in the area of each SunCatcher as well as on either side of the surface-treated arterial roadways. (Ex. 300, p. B.1-10.)

After brush has been trimmed, blading for roadways and foundations would be conducted between alternating rows to provide access to individual SunCatchers. Blading would consist of limited removal of terrain undulations. Although ground disturbance would be minimized wherever possible, the applicant proposes that localized rises or depressions within the individual 1.5-MW solar groups would be removed to provide for proper alignment and operation of the individual SunCatchers. Surface-treated roadways would be constructed as close to the existing topography as possible, with limited cut-and-fill operations to maintain roadway design slope to within a maximum of 10 percent. (Ex. 300, p. B.1-10.)

The layout of the proposed Calico Solar Project would maintain the local pre-development drainage patterns where feasible, and water discharge from the site would remain at the southern and western boundaries. The paved roadways would have a low-flow, unpaved swale or roadway dip as needed to convey nuisance runoff to existing drainage channels. It is expected that storm water runoff would flow over the crown of the paved roadways, which are typically less than 6 inches from swale flow line to crown at centerline of roadway, thus maintaining existing local drainage patterns during storms. The applicant has proposed that low-flow culverts would be used on emergency access routes and all other roads would be at grade. (Ex. 300, p. B.1-10.)

The Applicant has proposed localized channel grading on a limited basis to improve channel hydraulics within the dry washes and to control flow direction where buildings and roadways are proposed. The Main Services Complex would be protected from a 100-year flood by berms or channels that would direct the flow around the perimeter of the building site, if required. (Ex. 300, p. B.1-10.)

Arizona Crossings (roadway dips) would be placed along the roadways, as needed to cross the minor or major channels/swales. These designs would be based on Best Management Practices (BMPs) for erosion and sediment control. Arizona Crossings would also be used for major washes where the channel cross section exceeds 8 feet in width and 3 feet in depth or exceeds 20 feet in width and 2 feet in depth. The roadway section at the channel flow line would be without a crown. (Ex. 300, p. B.1-10.)

It is anticipated that roadway maintenance would be required after rainfall events. For minor storm events, it is anticipated that the unpaved roadway sections may need to be bladed to remove soil deposition, along with sediment removal from stem pipe risers at the culvert locations. For major storm events, in addition to the aforementioned maintenance, roadway repairs may be required due to possible damage to pavement where the roadways cross the channels and where the flows exceed the culvert capacity. Additional maintenance may be required after major storm events to replace soil eroded from around SunCatcher pedestals located in washes. (Ex. 300, pp. B.1-10 to B.1-11.)

Building sites would be developed per San Bernardino County drainage criteria, with provision for soft bottom storm water retention basins, if necessary. Rainfall from paved areas and building roofs would be collected and directed to the storm water retention basins. Volume on retention or detention basins should have a total volume capacity for a 3-inch minimum precipitation covering the entire site. Volume can be considered by a combination of basin size and additional volume provided within paving and/or landscaping areas. (Ex. 300, p. B.1-11.)

The retention basins, if any are necessary, would be designed so that the retained flows would empty within 72 hours after the storm to provide mosquito abatement. This design can be accomplished by draining, evaporation, infiltration, or a combination thereof. (Ex. 300, p. B.1-11.)

The post-development flow rates released from the project site are expected to be less than the pre-development flow rates, thus complying with BMPs. The expected flow reduction is based on the following factors.

- Except for the building sites, roads, and two evaporation ponds, the majority of the project site would remain pervious; only a negligible portion of the site would be affected by pavement and SunCatchers foundations.
- The increased runoff expected from the building sites would be over-mitigated by capturing 100 percent of the runoff in a retention basin, where the storm runoff would be infiltrated and/or evaporated to the atmosphere.
- The proposed perforated risers to be constructed upstream of the roadway culverts would provide for additional detention. (Ex. 300, p. B.1-11.)

5. Buildings

The Main Services Complex would be located within the project site in a central location that provides for efficient access routes for maintenance vehicles servicing the SunCatcher solar field. The main control room would be located at the Main Services Complex.

Warehouse and shop spaces would provide work areas and storage for spare parts for project maintenance. The Main Services Complex would contain meeting and training rooms, maintenance and engineering offices, and administrative offices.

The project administration offices and personnel facilities would be located in a one-story operation and administration building. The operation and administration building would measure approximately 60 feet long by 70 feet wide by 17 feet high. This building would also contain meeting and training rooms, engineering offices, a visitor's room, and support services.

The project maintenance facilities, shop, and warehouse storage would be located adjacent to the operation and administration building. The maintenance building would measure 70 feet wide by 70 feet long by 17 feet in height. This building would contain maintenance shops and offices, PCU rebuild areas, maintenance vehicle servicing bays, chemical storage rooms, the main electrical room, and warehouse storage for maintenance parts to service the SunCatchers.

The three assembly buildings will be located beside the Main Services Complex. Assembly buildings will be decommissioned after the project's SunCatchers are assembled and installed.

A water treatment shade structure will be located next to the Main Services Complex and to the northeast side of the Main Services Complex. The water treatment structure will house water treatment equipment and safe storage areas

for water treatment chemicals. A motor control center for the water treatment equipment and pumps will be located within this structure. Two wastewater evaporative ponds designed for water treatment wastewater containment will be located just north of the water treatment structure. A control building will be located near the project substation. This building will contain relay and control systems for the substation in one room and the project operations control room in another room or rooms. A diesel-powered fire water pump and a diesel operated standby power generator will be located adjacent to the operation and administration building on the north side.

Electric service for the Main Services Complex will be obtained from SCE. Electric power will be provided via overhead service from an SCE overhead distribution line located on the north side of I-40. Communications service for the Main Services Complex will be obtained from the local phone company. Communications service will be provided via an overhead service from existing underground communications lines located on the north of I-40.

The operation and administration building, maintenance building, and Main Services Complex would be painted with a matching desert sand color and would be manufactured buildings. The water treatment building and the water holding tanks, including the potable water, raw water, and demineralized/fire protection water tanks located at the Main Services Complex would also be painted with a matching desert sand color.

SunCatcher assembly would be performed on-site in temporary structures. These buildings would be decommissioned after all project SunCatchers are assembled and installed. The assembly buildings would be located beside the Main Services Complex.

The primary purpose of the SunCatcher assembly buildings would be the assembly of the SunCatcher superstructure, the main beam assembly and trusses, the pedestal trunnion, mirrors, wire harnesses, control systems, drive position motors, and the calibration of the mirrors and control systems before field installation. Each assembly bay would be equipped with an automated platform on locating rails to move the SunCatcher through the assembly process.

The exterior material for the assembly buildings would be a fire retardant vinyl fluoride film with ultraviolet blocking characteristics and would be chemical and weather resistant. The exteriors would be painted desert sand to match the other structures.

Transport trailer storage would be located adjacent to the assembly building. The storage area would allow the project to maintain a supply of 3 to 5 days of inventory of SunCatcher parts during the assembly phase of construction.

These assembly buildings would be decommissioned and salvaged after all SunCatchers for the Project are installed.

6. Water Supply and Treatment

The following types of water would be required for the project: equipment washing water; potable water; dust control water, and fire protection water. When completed, the Calico Solar Project would require a total of approximately 36.2 acre-feet of raw water per year. SunCatcher mirror washing and operations dust control under regular maintenance routines will require an average of approximately 10.4 gallons of raw water per minute.

The applicant proposes the use of ground water from the Lavic Groundwater Basin. The applicant initiated the drilling of four water wells adjacent to the project site, within the Lavic Groundwater Basin. As wells are drilled the flow rate (gallons per minute – gpm) were determined, concern over sufficiency of this water supply lead to the identification of a new primary water supply from Burlington Northern Santa Fe (BNSF). Initially, the Lavic Ground Basin wells were to be used as a backup water source since they were believed to lack the capacity to provide for construction water needs. The applicant subsequently discovered that one of the wells within the Lavic Groundwater Basin could provide enough water for construction and operations of the proposed project and has returned to well water from the Lavic Groundwater Basin as the primary water source for the project.

The water from the Lavic Groundwater Basin well is characterized as raw water and will require treatment to remove dissolved solids for SunCatcher mirror wash water applications. The water will be required to be demineralized to prevent mineral deposits forming on the SunCatcher mirrors. Processes available for demineralization are Reverse Osmosis (RO) and ion exchange.

<u>Potable Water</u>: Potable water to meet plant requirements would be delivered by truck or rail and stored in a 5,000-gallon tank in the water treatment area. This tank would be able to provide all required potable water for the operating facility for 2-3 days at which time it would need to be replenished.

<u>Mirror Washing and Fire Protection Water</u>: The Main Services Complex will include a location for an approximately 230,000-gallon tank that will be used to

store water for SunCatcher mirror washing and fire protection applications. This volume of water will meet all LORS, including fire protection water for the Newberry Springs and the Harvard Station 46 (a County Fire Department staffed station), and for the San Bernardino Fire Department.

Dust Control Water: The water will be conveyed to the Main Services Complex via a 6 to 8-inch-diameter water line. The expected average well water consumption for the project during construction is approximately 50 acre-feet per year. Under normal operation (inclusive of mirror cleaning, dust control, and potable water usage), water required will be approximately 36.2 acre-feet per year. Emergency water may be trucked in from local municipalities. The Applicant would seek agreements at the time of the emergency.

The Calico Solar Project water supply requirements are tabulated in **Project Description Table 2**, Water Usage Rates for Operation. The table provides both the expected maximum water usage rates and the annual average usage rates.

Project Description Table 2
Water Usage Rates for Operation

Water Use	Daily Average (gallons per minute)	Daily Maximum (gallons per minute)	Annual Usage (acre feet)
Equipment Water Requirements			
SunCatcher Mirror Washing	11.8[1]	19.7[2]	16.1[3]
Water Treatment System Discharge			
Brine to Evaporation Ponds	6.0	11.1[4]	8.1
Potable Water Use			
For drinking and sanitary water requirements	3.8[5]	4.6[6]	5.2[7]
Dust Control			
Well water for dust control during operations	4.2[8]	8.3[9]	6.7[10]
Totals	**25.8**	**43.7**	**36.2**

Source: Ex. 300, p. B.1-14

[1] Based on 34,000 SunCatchers requiring a monthly wash with an average of 14 gallons of demineralized water per spray wash and a 5-day work week (21 work days per month).

[2] During a 3-month period, all SunCatcher mirrors are given a scrub wash requiring up to three times the normal wash of 14 gallons per SunCatcher. Therefore, the Daily Maximum usage rate is based on 2/3 of the SunCatchers receiving a normal wash and one third receiving a scrub wash.

[3] Based on every SunCatcher having approximately 8 normal washes per year with one additional scrub wash.

[4] Based on the maximum amount of demineralized water required for mirror washing and assumes a decrease in raw water quality requiring an additional 20% of system discharge.

[5] Assumes 30 gallons per person per day for 182 people. [6] Max. amount assumes a 20% contingency over the Daily Avg.

[7] Assumes a 6-day work week and average daily usage. [8] Assumes 5,000 gallons per day.

[9] Assumes up to 10,000 gallons per day. [10] Assumes daily average dust control operations.

7. Wastewater and Waste Management

The water treatment wastewater generated by the reverse osmosis (RO) unit would contain relatively high concentrations of total dissolved solids (TDS). Wastewater or brine generated by the RO unit would be discharged to a polyvinyl chloride (PVC)-lined concrete evaporation pond that meets the requirements of the local Regional Water Quality Control Board (RWQCB). Each pond would be sized to contain 1 year of discharge flow, approximately 2.44 million gallons. A minimum of 1 year is required for the water treatment waste to undergo the evaporation process. The second pond would be in operation while the first is undergoing evaporation. The two ponds would alternate their functions on an annual basis.

After the brine has gone through the evaporation process, the solids that settle at the bottom of the evaporation pond will be tested by the applicant and disposed of in an appropriate non-hazardous waste disposal facility. The solids would be scheduled for removal during the summer months, when the concentration of solids is at its greatest due to an increase in evaporation rates, in order to achieve maximum solids removal.

Sanitary wastewater generated at the facility cannot be conveyed to an existing sewage facility or pipeline as there are no public or private entities that manage sanitary wastewater flows for locations in the vicinity of the project site. The wastewater generated at the Main Services Complex will be discharged into a sub-surface wastewater disposal system with septic tanks and leach fields, and will be designed in accordance with the applicable LORS, including San

Bernardino County, California State Regional Water Quality Board, and the Department of Health Services.

The general threshold limit for a standard approval process for septic tanks and leach fields through the local RWQCB is 500 gallons per acre per day. The expected daily sanitary wastewater flow from Calico Solar ranges from an average of 5,500 gallons to a peak of 6,600 gallons; the required set aside area given this flow is approximately 14 acres. Given the project site area is much greater than 14 acres, the threshold limit for septic tank and leachfield applications will be met. The required leachfield area is estimated to be approximately 1,100 square-feet (0.025 acre).

8. Hazardous Waste Management

Hazardous materials used during facility construction and operations would include paints, epoxies, grease, transformer oil, caustic electrolytes (battery fluid), and products that would be generated by the construction equipment, such as waste fuel and waste oil. Several methods would be used to properly manage and dispose of hazardous materials and wastes. Waste lubricating oil would be recovered and recycled by a waste oil recycling contractor. Chemicals would be stored in appropriate chemical storage facilities. Bulk chemicals would be stored in large storage tanks, while most other chemicals would be stored in smaller returnable delivery containers. All chemical storage areas would be designed to contain leaks and spills in concrete containment areas.

9. Hydrogen System

The Applicant described the hydrogen use, supply and storage in the AFC, filed in December 2008. In the original design, it was proposed that hydrogen would be supplied to the SunCatchers through a distributed system. Each of the SCE, within the SunCatcher unit, would contain 14 cubic feet of hydrogen gas, and each SunCatcher unit would be equipped with a 196-scf k-bottle to replenish hydrogen gas lost within the gas circuit. K-bottles would be provided by a commercial hydrogen supplier. The Applicant responded to Energy Commission and BLM Data Requests 57-60 in July 2009, updating the hydrogen system to include a centralized hydrogen gas supply, storage and distribution system. (Ex. 5d.) The system included onsite generation of hydrogen through electrolysis and the storage of that hydrogen in a 36,400 scf steel storage tank. From the storage tank, the hydrogen would be piped to 95 individual compressor groups that include a compressor, a high pressure supply tank and a low pressure dump tank

used to recover hydrogen from non-operational PCUs through a return line. (Ex. 300, p. B.1-16.)

At this time, the applicant is evaluating the relative advantages between the centralized hydrogen distribution system and a distributed system that utilizes k-bottles on the PCUs of all SunCatchers. Therefore, both systems are described below. (Ex. 300, p. B.1-16.)

Centralized Hydrogen System Description**.** Based on the evidence**,** the details of the centralized hydrogen system have been refined by the applicant as a result of experience from the applicant's Maricopa Solar Project and as a result of design having progressed to final engineering. The maximum amount of hydrogen stored for each SunCatcher would be increased from 3.4 to 11 scf which would accommodate two full charges of the PCU. In order to support this increased hydrogen storage at each SunCatcher, the high pressure supply tanks and low pressure dump tanks at each compressor group would accommodate 29,333 scf and 9,900 scf, respectively. In the July 2009 responses Energy Commission and BLM Data Requests 57-60, each high pressure supply tank was anticipated to be 648 scf and each low pressure dump tank was also reported to be 648 scf. (Ex. 300, p. B.1-16.)

If a centralized hydrogen system is used at the Calico Solar site, the hydrogen gas would be produced through electrolysis by two redundant hydrogen generators. Each proposed hydrogen generator would be capable of producing 1,820 scfh. Although the hydrogen generators could run full time if needed to supply sufficient amount of hydrogen to the SunCatchers, the generators would be operated at off-peak electric hours using grid power and generated hydrogen would be stored onsite. Hydrogen gas produced by the onsite generators would be stored in a steel storage tank. The hydrogen tank, at approximately nine feet in diameter by 30 feet long, would be capable of storing approximately two-day supply of hydrogen (i.e., approximately 36,400 scf). (Ex. 300, p. B.1-16.)

The hydrogen storage tank would distribute hydrogen fuel to 95 individual compressor groups. Each compressor group would be electrically operated and would consist of a compressor and a high pressure supply tank with a 29,333 scf capacity, delivering gas at approximately 2,760 psi. Each compressor group would also be equipped with a low pressure dump tank with the same 9,900 scf capacity and used to recover hydrogen from non-operational PCUs through a ¼" and ½" stainless steel return line. In this option there are no other holding tanks or storage tanks in the compressor groups. Delivery of hydrogen is through pipelines. (Ex. 300, pp. B.1-16 to B.1-17..)

Distributed Hydrogen System Description. If the distributed hydrogen supply system utilizing k-bottles at each SunCatcher PCU is utilized at the Calico Solar site, the system would use two redundant hydrogen generators and one steel storage tank located at the Main Services Complex as described in the centralized system. However, the system would not deliver hydrogen through pipelines. In lieu of the distribution equipment, hydrogen would be filled from the hydrogen storage tank to each individual SunCatcher through trucks. Each SunCatcher would include an 82-scf high pressure supply tank, 28-scf low pressure dump tank, and a 489-scf local storage tank. In addition, each SunCatcher unit would contain a minimum of 11-scf of hydrogen at 580 psi at all times, resulting in a total of around 610-scf of hydrogen in each SunCatcher. (Ex. 300, p. B.1-17.)

The k-bottles would be delivered back to each SunCatcher, utilizing the mirror-washing truck trips. Hydrogen refilling and replacement trips are expected occur approximately three times per year. (Ex. 300, p. B.1-17.)

10. Transmission System Interconnection and Upgrades

The proposed project would include the construction of a new 230-kV Calico Solar Substation approximately in the center of the project site. The proposed project substation would consist of an open air bus with 15, 35-kV collection feeder circuit breakers. Each feeder breaker would be connected to one of the 48-MW or 51-MW overhead collection lines. Additional 35-kV circuit breakers would connect to power factor correction capacitor banks located in the substation yard. This new substation would be connected to the existing SCE Pisgah Substation via an approximately 2-mile, single-circuit, 230-kV transmission line. Other than this interconnection transmission line, no new transmission lines or off-site substations would be required for the 275-MW Phase I construction. (Ex. 300, p. B.1-17.)

For the 275-MW Phase I of the project, the first interconnection substation would initially consist of two power transformers rated at 120/160/200 megavolt amperes (MVA) each to convert the generation collection voltage from 34.5 kV to the transmission tie voltage of 230 kV. The substation would ultimately contain 6 120/160/200-MVA, 34.5-kV to 230-kV step-up power transformers. Each power transformer would serve 3 of the 15 overhead collection lines (one 48-MW line and 2 51-MW lines). (Ex. 300, p. B.1-17.)

The power transformers would be protected by 230-kV power circuit breakers. Provisions would be made to expand the Calico Solar Substation from 275 to 850

MW with the addition of three power transformers in Phase II of the proposed project. Each transformer would collect 150 MW of generation via three overhead 34.5-kV collection circuits, each protected by a 35-kV power circuit breaker. The 34.5-kV feeders would be terminated on outdoor circuit breakers. (Ex. 300, pp. B.1-17 to B.1-18.)

Control, metering, and protection systems for the line, substation, and collection systems would be contained within a control building located adjacent to the Calico Solar Substation. The control building would also contain the necessary communications equipment to meet owner, California Independent System Operator (California ISO), and SCE requirements. Additional substation equipment would include a 34.5-kV power-factor correction capacitor control system designed to meet the power factor and zero and low-voltage ride-through requirements of the Interconnect Agreement. (Ex. 300, p. B.1-18.)

The on-site portion of the interconnection transmission line would be installed in a 100-foot ROW from the Calico Solar Project substation southeast to point of intersection with the SCE transmission ROW, then southwest to parallel the transmission ROW to the Pisgah Substation. (Ex. 300, p. B.1-18.)

The transmission line towers would consist of H-Frame towers at the undercrossing of the existing 500-kV transmission line and double-circuit lattice steel towers and/or steel poles elsewhere. Both circuits of the overhead 230-kV transmission line would be constructed with one 1,590-kilo circular miles/phase, aluminum steel-reinforced conductor per line, each thermally rated to carry full project output in emergency conditions and one-half of project output in normal conditions. Two fiber optic cables would be provided for communication with SCE and the California ISO.

11. Facility Closure

Project closure can be temporary or permanent. Temporary closure is defined as a shutdown for a period exceeding the time required for normal maintenance. Causes for temporary closure include inclement weather and/or natural hazards (e.g., winds in excess of 35 mph, or cloudy conditions limiting solar insolation values to below the minimum solar insolation required for positive power generation, etc.), or damage to the project from earthquake, fire, storm, or other natural acts. Permanent closure is defined as a cessation in operations with no intent to restart operations owing to project age, damage to the project that is beyond repair, adverse economic conditions, or other significant reasons. (Ex. 300, p. B.1-21.)

In the unforeseen event that the project is temporarily closed, a contingency plan for the temporary cessation of operations will be implemented. The contingency plan will be followed to ensure conformance with applicable LORS and to protect public health, safety, and the environment. The plan, depending on the expected duration of the shutdown, may include the draining of chemicals from storage tanks and other equipment and the safe shutdown of equipment. Wastes will be disposed of according to applicable LORS, as discussed in the **Waste Management** section of this Decision. (Ex. 300, p. B.1-21.)

The planned life of the Calico Solar Project is 40 years. However, if the project is still economically viable, it could be operated longer. It is also possible that the project could become economically noncompetitive before 40 years have passed, forcing early decommissioning. Whenever the project is permanently closed, the closure procedure will follow a plan that will be developed as described below. (Ex. 300, p. B.1-21.)

The removal of the project from service, or decommissioning, may range from "mothballing" to the removal of equipment and appurtenant facilities, depending on conditions at the time. Because the conditions that would affect the decommissioning decision are largely unknown at this time, these conditions would be presented to the Energy Commission, the BLM, and other applicable agencies for review and approval as part of the decommissioning plan. The decommissioning plan would discuss the following:

- proposed decommissioning activities for the project and appurtenant facilities constructed as part of the project,
- conformance of the proposed decommissioning activities with applicable LORS and local/regional plans,
- activities necessary to restore the project site if the plan requires removal of equipment and appurtenant facilities,
- decommissioning alternatives other than complete restoration to the original condition, and
- associated costs of the proposed decommissioning and the source of funds to pay for the decommissioning.

In general, the decommissioning plan for the project would attempt to maximize the recycling of project components. Calico Solar would attempt to sell unused chemicals back to the suppliers or other purchasers or users. Equipment containing chemicals would be drained and shut down to ensure public health and safety and to protect the environment. Nonhazardous wastes will be

collected and disposed of in appropriate landfills or waste collection facilities. Hazardous wastes will be disposed of according to applicable LORS. The site will be secured 24 hours per day during the decommissioning activities, and Calico Solar will provide periodic update reports to the Energy Commission, the BLM, and other appropriate parties. (Ex. 300, p. B.1-22.)

Similar to project construction and facility operations, decommissioning would be performed in accordance with plans and mitigation measures that would assure the project conforms to applicable LORS and would avoid significant adverse impacts. These plans that are to be developed by the applicant, for which some have already been prepared in draft and reviewed by staff to support this environmental analysis, and the necessary mitigation measures, are specified in the Conditions of Certification as appropriate for each technical area of this SSA. The BLM would also require mitigation and restoration as stipulated in the identified Plan of Development, as well as other federal agency requirements. The authorized project would be bonded consistent with agency policy. (Ex. 300, p. B.1-22.)

FINDINGS OF FACT

Based upon the evidentiary record, we find as follows:

1. Calico Solar LLC will own and operate the project, which will be located within San Bernardino County on 4,613 acres of public land managed by the BLM, 37 miles east of Barstow, California.

2. The project would be constructed in two phases, with the first phase divided into subphases. Phase 1a would consist of 60 SunCatchers configured in a single group and much of the support facilities. Phase 1b and then Phase 2 would contain the remaining 26,390 SunCatchers arranged in 1.5-MW solar groups of 60 SunCatchers per group, bringing the CSP to its net nominal generating capacity of 663.5 MW.

3. The primary equipment for the generating facility would include approximately 26,450 SunCatchers, their associated equipment and systems, and their support infrastructure.

4. The proposed Calico Solar Project also includes a new 230-kilovolt (kV) Calico Solar Substation, 2.0 miles of electrical transmission line, an administration building, maintenance complex, onsite routes interior to the project boundaries, a site access road and bridge over the Burlington Northern Santa Fe railroad tracks. Approximately 739 feet of the 2-miles of single-circuit, 230-kV generation interconnection transmission line would be constructed off the project site but still on BLM managed land. The

transmission line would connect the proposed Calico Solar Substation to the existing Southern California Edison (SCE) Pisgah Substation.

5. The Lavic Groundwater Basin will be used as the primary water source for the project.

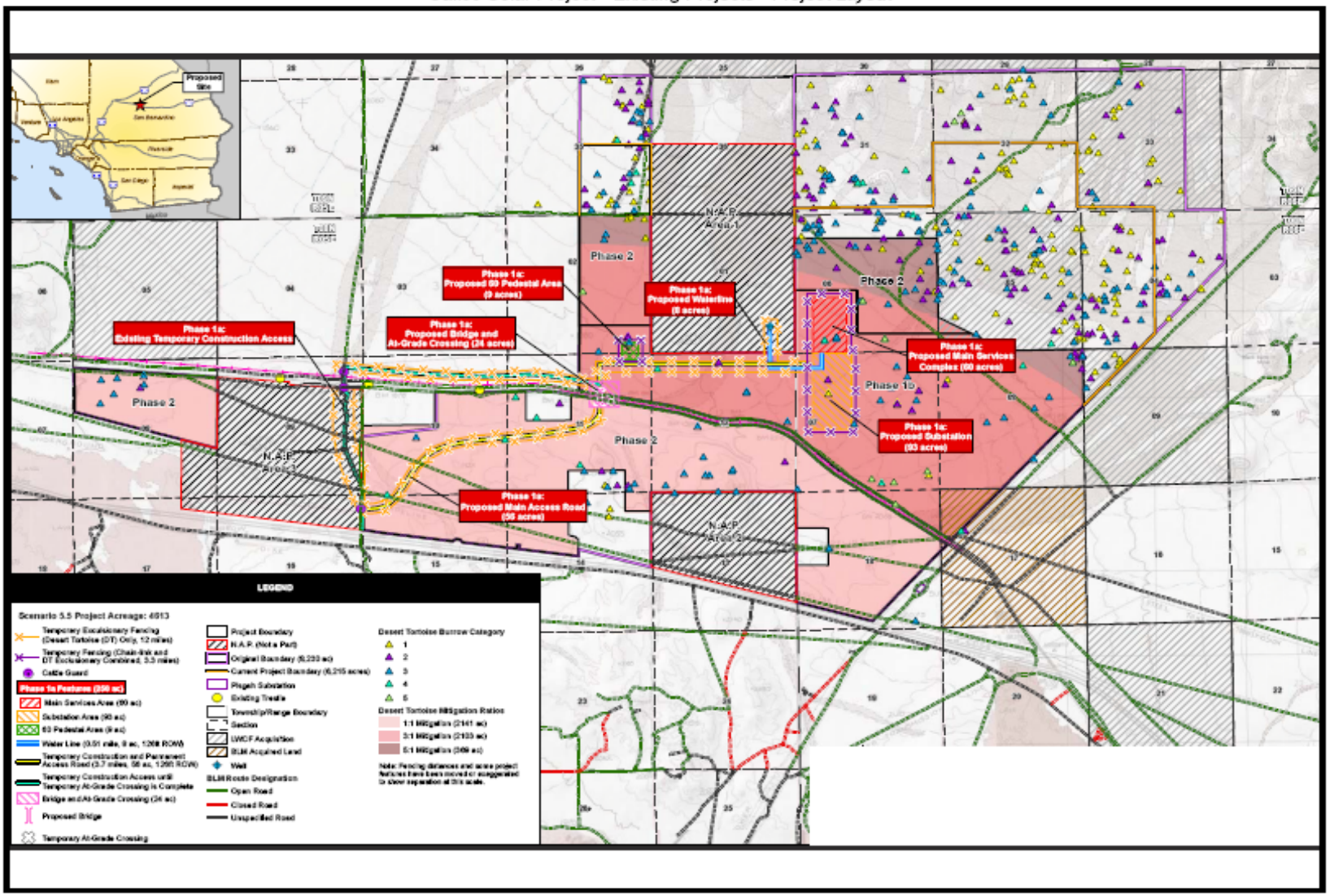
6. The proposed project would include the construction of a new 230-kV Calico Solar Substation approximately in the center of the project site. This new substation would be connected to the existing SCE Pisgah Substation via an approximately 2-mile, single-circuit, 230-kV transmission line. Other than this interconnection transmission line, no new transmission lines or off-site substations would be required for the 275-MW Phase I construction.

CONCLUSION OF LAW

1. We therefore conclude that the Calico Solar Project is described at a level of detail sufficient to allow review in compliance with the provisions of the Warren-Alquist Act, the California Environmental Quality Act, and the National Environmental Policy Act.

PROJECT DESCRIPTION - FIGURE 1

Calico Solar Project - Existing Projects - Project Layout



II. PROJECT ALTERNATIVES

The California Environmental Quality Act (CEQA) Guidelines and the Energy Commission's regulations require an evaluation of the comparative merits of a range of feasible site and facility alternatives which meet the basic objectives of the proposed project but would avoid or substantially lessen potentially significant environmental impacts. [Cal. Code Regs., tit. 14, §§ 15126.6(c) and (e); tit. 20, § 1765.]

The range of alternatives, including the "No Project" alternative, is governed by the "rule of reason" and need not include those alternatives whose effects cannot be reasonably ascertained and whose implementation is remote and speculative. [Cal. Code Regs. tit. 14, § 15126.6(f).] Rather, the analysis is necessarily limited to alternatives that the "lead agency determines could feasibly attain most of the basic objectives of the project." (*Id*.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

Energy Commission staff used the following methodology to analyze project alternatives for the Calico Solar Project (CSP):

- identified basic objectives of the project and its potentially significant adverse impacts;
- identify and evaluate alternative sites to determine whether an alternative site would mitigate impacts of the proposed site and whether an alternative site would create impacts of its own;
- identify and evaluate technology alternatives, including alternative equipment and processes; and
- evaluated consequences of not constructing the project, i.e., the "No Project" alternative. (Ex. 300, p. 4-4.)

1. Project Objectives

For our analysis, we will consider the following objectives, a reduction and refinement of those proposed by the applicant:

- To construct and operate an up to 663.5 MW renewable power generating facility in California capable of selling competitively priced renewable energy consistent with the needs of California utilities;

- To locate the facility in areas of high insolation with ground slope of less than 5%.
- To provide clean, renewable electricity to support California's Renewable Portfolio Standard Program (RPS);
- To assist in reducing its greenhouse gas emissions as required by the California Global Warming Solutions Act;
- To contribute to the achievement of the 33% RPS target set by California's governor and legislature; and
- To complete the review process in a timeframe that would allow the applicant to start construction or meet the economic performance guidelines by December 31, 2010 to potentially qualify for the 2009 ARRA cash grant in lieu of tax credits for certain renewable energy projects. (Ex. 300, p. B.2-9.)

2. Project Impacts

In this Decision, the Commission has found the following significant impacts. Based on the evidence presented, the following impacts have been identified as issues of concern for the CSP project.

- **Cultural Resources**. The CSP cumulative contribution to permanent long term, potentially unmitigable, adverse impacts to historic Route 66 in the project vicinity as a result of the physical degradation of and visual intrusion on significant cultural resources on those sites and an overall net reduction in cultural resources in the area

- **Land Use**. The CSP project would permanently change the nature of land use at the project site from Government Special Public Limited Use and Moderate Use to an intensive utility use for the generation of power. Therefore, the combined effect of the overall cumulative past, present, and proposed and reasonably foreseeable projects, including the proposed project, in the desert region of San Bernardino County would adversely affect recreation and wilderness resources, resulting in a significant and unavoidable impact under CEQA

- **Visual Resources**. The CSP project will result in the installation of a large, industrial facility on a presently undeveloped (although partially disturbed) landscape. It will have significant unmitigable impacts to visual vistas from three of five vantage points used in our analysis. In addition it will, in combination with the other renewable energy projects proposed in the project's viewshed, make a cumulatively considerable contribution to significant cumulative visual impacts.

This alternatives analysis focuses on the consideration of these impacts and the extent to which they could be reduced or eliminated by the selection of a project alternative.

3. Summary of Alternatives Considered

Various site alternatives, technology alternatives, a reduced size alternative and the no project alternative were initially evaluated and retained or eliminated from further detailed analysis as summarized in **Alternatives Table 1**, below. More information about the eliminated alternatives may be found in the Supplemental Staff Assessment (Ex. 300, pp. B.2-49 — B.2-84). Further analysis of the retained alternatives follows the table.

Alternatives Table 1
Summary of Alternatives Retained and Eliminated

Alternative	Rationale for Retention or Elimination
Proposed Project/Action **Presently:** - 663.5 MW - 4,613 acres 26,450 SunCatchers **Formerly:** - 850 MW - 6,215 acres - 34,000 SunCatchers	Retained. Evaluated as the applicant's proposal.
Reduced Acreage Alternative - 275 MW (up to 350 MW)[6] - 2,600 acres (41% of originally proposed) - 11,000 SunCatchers	Retained. Evaluated in the SSA because it would substantially reduce impacts of the Calico Solar Project while meeting most or all of the project objectives.
No Project/No Action Alternative	Retained. Required under CEQA.
Private Land Alternative	Retained. Would substantially reduce impacts of the Calico Solar Project while meeting most project objectives.
Public Land Alternatives	

[6] The Calico Solar Project as described in the SA/DEIS would require approximately 10 acres per MW of power generated. Since publication of the SA/DEIS, the Calico Solar Project boundaries have been revised and the project as currently proposed would require 7.3 acres per MW generated. As such, the amount of energy generated by the Reduced Acreage Alternative could be up to 350 MW.

Alternative	Rationale for Retention or Elimination
Avoidance of Donated and Acquired Lands Alternative - 850 MW - 7,050 acres (over 100 % of proposed) - 28,800 SunCatchers	Eliminated. Would not substantially reduce impacts of the Calico Solar Project; it would create the same general impacts to Mojave fringe-toed lizard, Nelson big-horn sheep, and other wide-ranging species as the proposed Calico Solar Project.
Camp Rock Road (AS1)	Eliminated. Would not substantially reduce impacts of the Calico Solar Project; located in Category I desert tortoise habitat, partially located in the Johnson Valley OHV area and would require use of LWCF acquisition lands.
Upper Johnson Valley (AS2)	Eliminated. Would not substantially reduce impacts of the Calico Solar Project; located entirely within the Upper Johnson Valley OHV Area and in study area for MCAGCC Twentynine Palms expansion.
West of Twentynine Palms Military Base (AS3)	Eliminated. Would not substantially reduce impacts of the Calico Solar Project; located entirely within the Upper Johnson Valley OHV Area and in study area for MCAGCC Twentynine Palms expansion, would require use of LWCF acquired lands.
I-40 South (AS4)	Eliminated. Would not substantially reduce impacts of the Calico Solar Project; located in desert tortoise critical habitat, would impact approximately 3 miles of the Pisgah Crater Lava Flow, would potentially impact access to three existing mines.
Broadwell Lake (AS5)	Eliminated. Would not substantially reduce impacts of the Calico Solar Project; potentially located within proposed national monument; pending right-of-way grant application for the site, therefore not considered a viable alternative.
SES Solar Three Alternative	Eliminated. Pending right-of-way grant application for the site, therefore not considered a viable alternative.
Technology Alternatives Evaluated	
Parabolic Trough Technology	Eliminated. Would not substantially reduce impacts of the Calico Solar Project
Solar Power Tower Technology	Eliminated. Would not substantially reduce impacts of the Calico Solar Project
Linear Fresnel Technology	Eliminated. Would reduce area required by 40% but would not eliminate significant impacts of the Calico Solar Project
Solar Photovoltaic Technology – Utility Scale	Eliminated. Would not substantially reduce impacts of the Calico Solar Project

Alternative	Rationale for Retention or Elimination
Distributed Solar Technology	Eliminated. While it will very likely be possible to achieve 850 MW of distributed solar energy over the coming years, the limited numbers of existing facilities make it difficult to conclude with confidence that this much distributed solar will be available within the timeframe required for the Calico Solar Project. Barriers exist related to interconnection with the electric distribution grid. Solar PV is one components of the renewable energy mix required to meet the California Renewable Portfolio Standard requirements, and additional technologies like solar thermal generation, would also be required.
Wind Energy	Eliminated. While there are substantial wind resources in the region, environmental impacts could also be significant so wind would not reduce impacts in comparison to the Calico Solar Project. Also, wind is one of the components of the renewable energy mix required to meet the California Renewable Portfolio Standard requirements; additional technologies like solar thermal generation, would also be required.
Geothermal Energy	Eliminated. Despite the encouragement provided by Renewable Portfolio Standards and ARRA funding, few new geothermal projects have been proposed in the California and no geothermal projects are included on the Renewable Energy Action Team list of projects requesting ARRA funds. Therefore, the development of 850 MW of new geothermal generation capacity within the timeframe required for the Calico Solar Project is considered speculative.
Biomass Energy	Eliminated. Most biomass facilities produce only small amounts of electricity (in the range of 3 to 10 MW) and so could not meet the project objectives related to the California Renewable Portfolio Standard. In addition, between 85 and 250 facilities would be needed to achieve 850 MW of generation, creating substantial adverse impacts.
Tidal Energy	Eliminated. Tidal fence technology is commercially available in Europe. However, it has not been demonstrated and proven at the scale that would be required to replace the proposed project, particularly with Pacific tides. Therefore, it would not substantially reduce impacts of the Calico Solar Project.

Alternative	Rationale for Retention or Elimination
Wave Energy	Eliminated. Unproven technology at the scale that would be required to replace the proposed project; it may also result in substantial adverse environmental impacts
Natural Gas	Eliminated. Would not attain the objective of generating renewable power meeting California's renewable energy needs
Coal	Eliminated. Would not attain the objective of generating renewable power meeting California's renewable energy needs and is not a feasible alternative in California
Nuclear Energy	Eliminated. The permitting of new nuclear facilities in California is not currently allowable by law
Conservation and Demand-side Management	Eliminated. Conservation and demand-management alone are not sufficient to address all of California's energy needs, and would not provide the renewable energy required to meet the California Renewable Portfolio Standard requirements

Ex. 300, pp. B.2-3 – B.2-6.

Alternatives Retained for Further Evaluation

Reduced Acreage Alternative

The Reduced Acreage Alternative would be a 275 MW solar facility located within the boundaries of the proposed project as defined by Calico Solar. This alternative is analyzed because (1) it eliminates about 59% of the proposed project area so all impacts are reduced, especially those related to desert washes, biological resources, and cultural resources, and (2) it could transmit the power generated without requiring an upgrade to 65 miles of the existing 220 kV SCE Pisgah-Lugo transmission line.

The Reduced Acreage Alternative would consist of 11,000 SunCatchers with a net generating capacity of approximately 275 MW (potentially up to 350 MW)[7] occupying approximately 2,600 acres of land. This alternative would retain 31% of the proposed SunCatchers and would affect 41% of the land of the previously proposed 850 MW project.

[7] The Calico Solar Project as described in the SA/DEIS would require approximately 10 acres per MW of power generated. Since publication of the SA/DEIS, the Calico Solar Project boundaries have been revised and the project as currently proposed would require 7.3 acres per MW generated. As such, the amount of energy generated by the Reduced Acreage Alternative could be up to 350 MW.

The boundaries of the Reduced Acreage Alternative are shown in **Alternatives Figure 1**. This area was designed to avoid sensitive cultural resources and areas that were mapped as occupied tortoise habitat (live tortoise and/or active burrows and sign). It also excludes all donated lands and lands acquired by BLM with conservation funds. The boundaries of the Reduced Acreage Alternative do not coincide with the Applicant's Phase I project boundaries.

Similar to the proposed project, the Reduced Acreage Alternative would transmit power to the grid through the SCE Pisgah Substation and would require infrastructure including water storage tanks, a transmission line, road access, a main services complex, and a substation (SES 2008a). However, as stated above, the Reduced Acreage alternative would not require the 65-mile upgrade to the SCE transmission line. SCE would complete system upgrades within existing substation boundaries to accommodate the 275 MW, and the 220 kV transmission line would be used. The main services complex, primary water well, and substation and onsite transmission line for the Reduced Acreage Alternative would remain at the location proposed for the proposed project.

The applicant believes this alternative is economically infeasible because it would have higher unit costs for SunCatcher manufacturing and higher operations and maintenance costs on a "per MW basis," increasing by as much as 30 percent. In addition, the applicant says that this smaller alternative would potentially put its receipt of ARRA funds at risk. However, the applicant did not provided details regarding its cost analysis for the Reduced Acreage Alternative. Absent more, we cannot conclude that this alternative is in feasible for the reasons advanced by the applicant. (Ex. 300, pp. B.2-13 – B.2-14.)

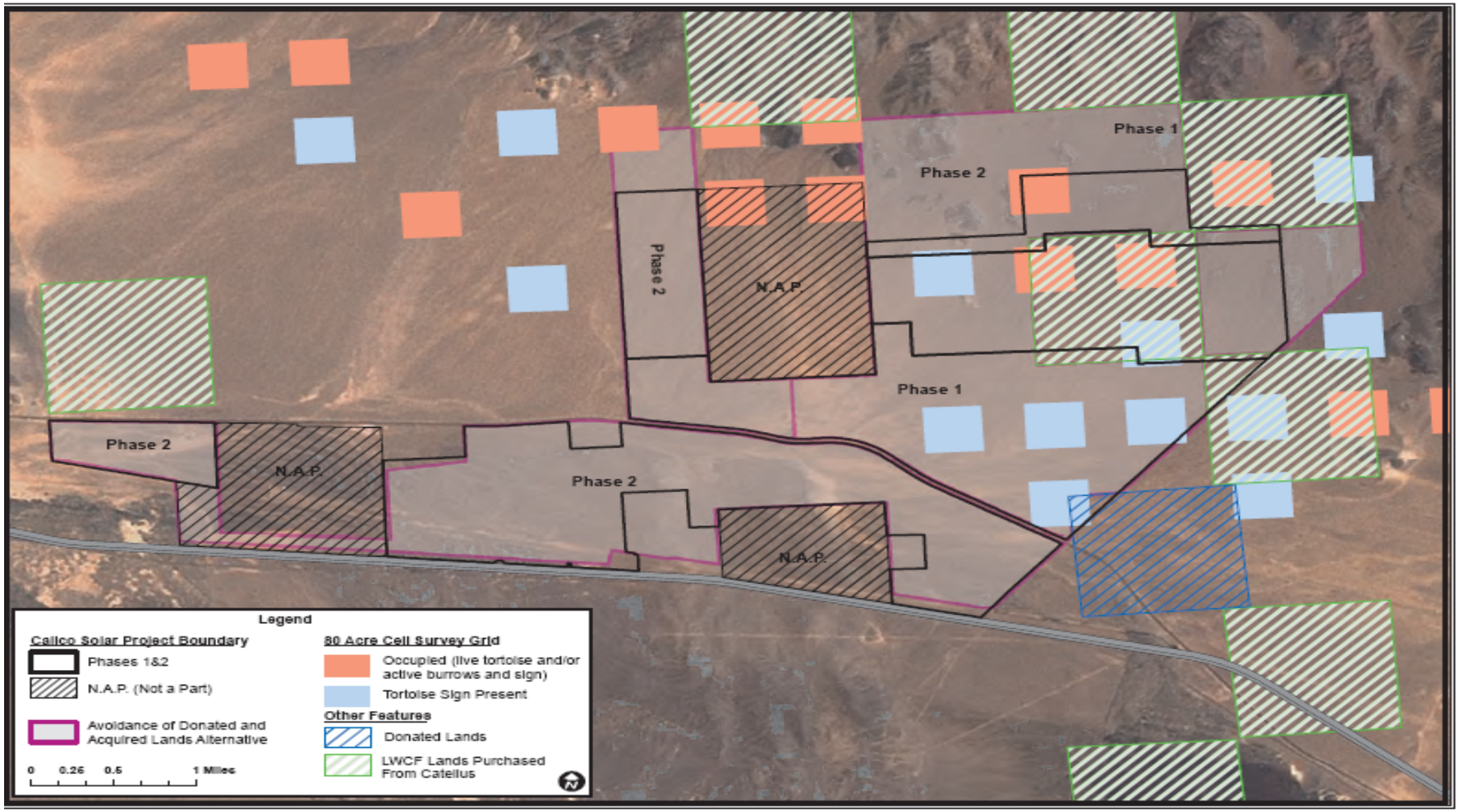
While the Reduced Acreage Alternative would reduce many of the impacts of the proposed project, it would also reduce the project's benefits of replacing fossil fuel fired generation and reducing associated criteria pollutant and greenhouse gas emissions.

Private Land Alternative

Multiple scoping comments requested that an alternative site be considered on disturbed land, and specifically on the agriculture lands and brownfields in the Daggett/Yermo area, thereby lessening the potential project impacts to the desert environment. Commenters also noted that because the technology allows for distributed units, a contiguous site may not be necessary.

ALTERNATIVES FIGURE 1

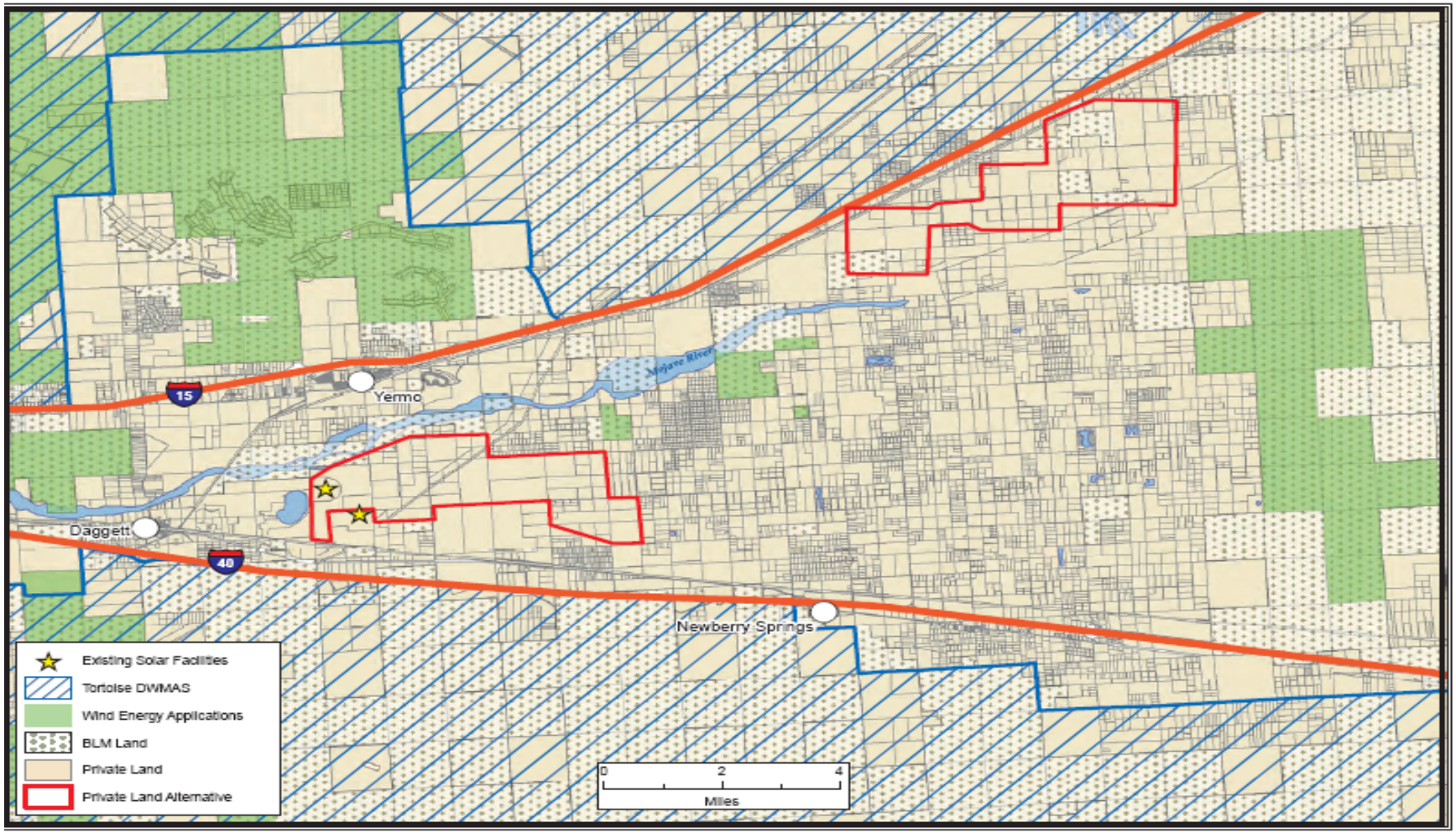
Calico Solar Project - Avoidance of Donated and Acquired Lands Alternative



U.S. BUREAU OF LAND MANAGEMENT & CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: California Energy Commission - Tele Atlas Data - San Bernardino County

ALTERNATIVES FIGURE 2

Calico Solar Project - Private Land Alternative



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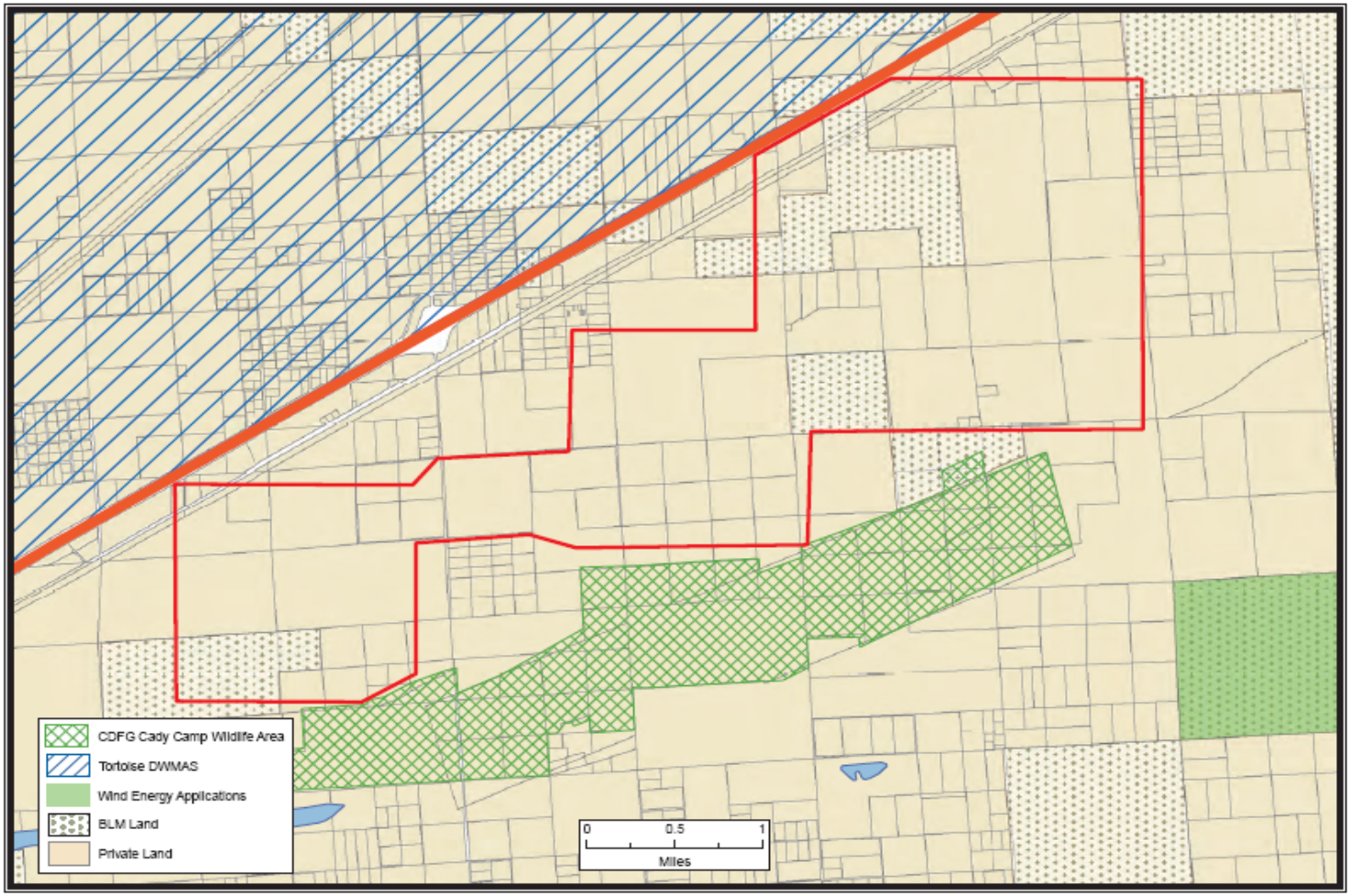
SOURCE: California Energy Commission - Tele Atlas Data - San Bernardino County

ALTERNATIVES - FIGURE 3A
Calico Solar Project - Private Land Alternative Northern Section

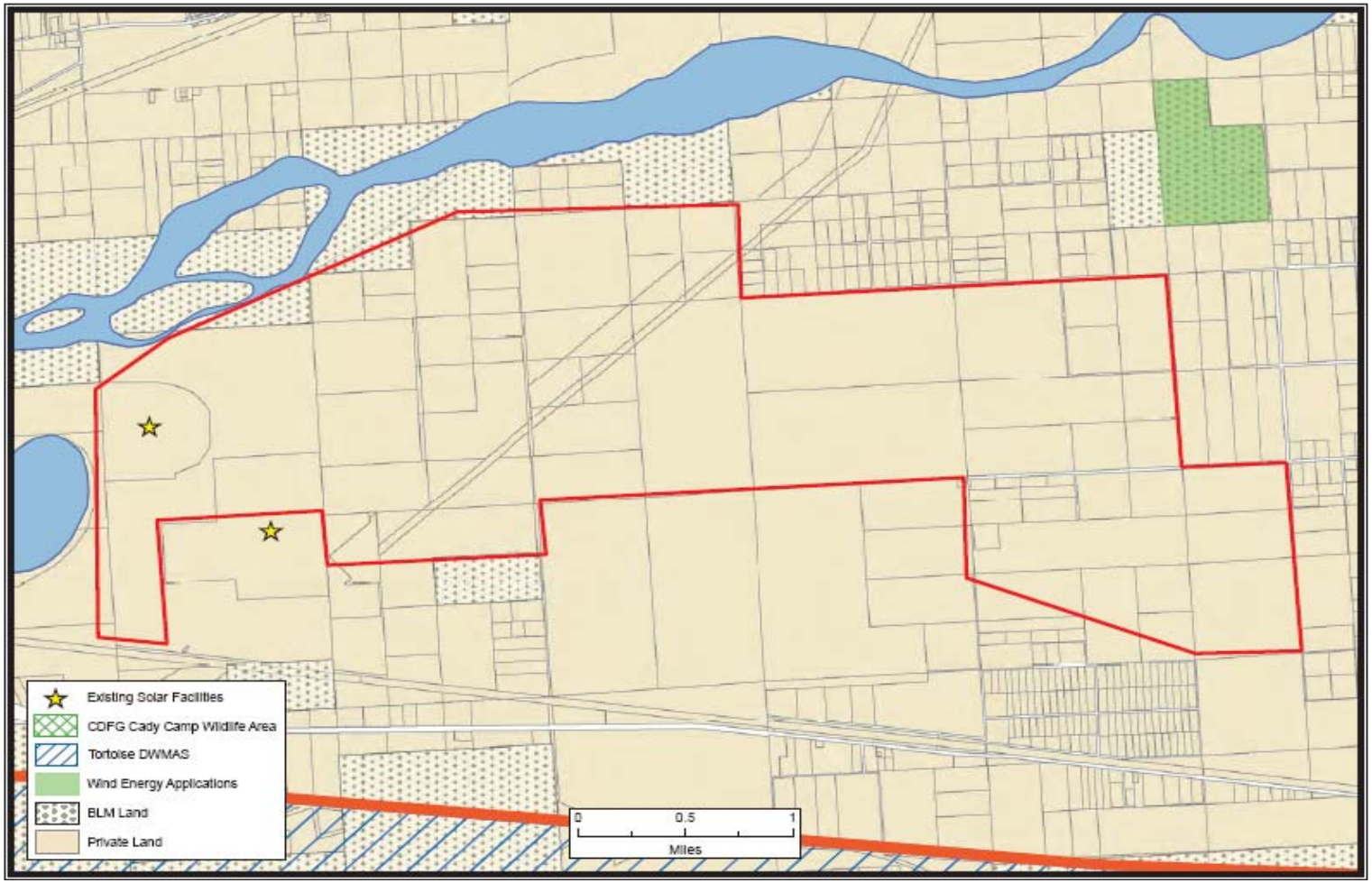


ALTERNATIVES

U.S. BUREAU OF LAND MANAGEMENT and CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: California Energy Commission - Tele Atlas Data - San Bernardino County

ALTERNATIVES - FIGURE 3B

Calico Solar Project - Private Land Alternative Southern Section



ALTERNATIVES

The applicant considered two alternatives in the AFC that included the use of some private land (Upper Johnson Valley – AS2, and I-40 South – AS4). These sites were eliminated from further consideration by the applicant because they lacked railroad access and major highway access and conflicted with other uses.

There are limited areas where undeveloped contiguous private land exists within the California desert with the slope and solarity requirements defined by the applicant. The RETI Phase 2A Draft Final Maps (9/01/09) identified private, disturbed land appropriate for solar development east of Barstow, bounded by I-15 on the north and I-40 on the south. The Mojave River passes through this region, and its floodplain ranges from about 2,000 feet to one mile wide. The river parallels I-15 on a northeasterly trend.

Alternatives Figure 2 shows this area of private land and **Alternatives Figures 3A and 3B** illustrate the alternative in more detail. This alternative is made up of two separate and unconnected sections. The Private Land Alternative northern section has a total of approximately 64 parcels (27 separate landowners) making up approximately 4,000 acres. The Private Land Alternative southern section has a total of approximately 45 parcels (22 separate landowners), also comprising approximately 4,000 acres. Because each section is approximately 4,000 acres, the alternative would require two phases, each approximately 425 MW. The alternative is considered viable as an alternative site because the Calico Solar project defines construction of separate groups of SunCatchers. However, because the alternative would not be one contiguous parcel, additional major equipment and substations would be required for at this site, increasing the cost of the project.

The Private Land Alternative northern section would be located on private land with a few BLM parcels included, south of and adjacent to Interstate 15 in the community of Harvard, north of Newberry Springs. The Private Land Alternative northern section has appropriate insolation and minimal slope. The elevation of the site is approximately 1,800 feet above mean sea level. The site would be accessed via Harvard Road, off Interstate 15 at the Harvard Road exit. The California Department of Fish and Game (CDFG) owns lands located just south of the site boundary. Additionally, there are several existing structures and residences on some of this private land, and removal of houses or other structures may be required.

The Private Land Alternative southern section is located north of the National Trails Highway and BNSF railroad. This land has appropriate insolation and minimal slope and has been previously graded for agriculture use. Existing solar thermal projects (SEGS I and II) are sited immediately south of the alternative and the original U.S. DOE Solar Two project was located at this site; however, it was decommissioned in November, 2009 and the site may potentially be developed as a solar energy project. The elevation of the site is between sea level and 20 feet below sea level. The site would be accessed via I-40 at the Hidden Springs Road exit.

The Private Land Alternative would require acquisition of approximately 110 parcels, although the number of separate landowners is fewer. Due to the number of parcels that would have to be acquired, this alternative would be substantially more challenging for an applicant to obtain site control (in comparison to BLM land). The applicant would have to negotiate separately with multiple landowners. The Draft Phase 2a Report published by the Renewable Energy Transmission Initiative (RETI) in early June 2009 identified private land areas for solar development only if there were no more than 20 owners in a 2 square mile (1,280 acre) area.

The Mojave River is located in between the Private Land Alternative northern section and the Private Land Alternative southern section. The river is dry most of the year and flows only during the largest rain events. The land use character of the immediate alternative site area is open space, agriculture, and rural residential. Desert Wildlife Management Areas (DWMA) for protection of desert tortoise are located north and south of the alternative.

Approximately five residences are located within the Private Land Alternative northern section. Existing agriculture structures are located on the Private Land Alternative southern section. The Private Land Alternative would also be located adjacent to low density residential areas near Daggett and Newberry Springs. The Private Land Alternative southern section would be located adjacent to an area zoned as regional industrial.

SCE Coolwater-Dunn Siding 115 kV transmission line runs through the Private Land Alternative northern and southern sections. The Private Land Alternative sites would require either an upgrade of the SCE Coolwater-Dunn Siding 115 kV transmission line or the construction of a new 10-mile 230 kV transmission line that would follow the existing corridor southwest to the Coolwater Substation. Both the Private Land Alternative sections would require substations; however, one transmission line could be used for both sites.

The Private Lands Alternative would have impacts similar to those of the proposed site in many disciplines. However, because this alternative would be on disturbed agricultural lands, the alternative site is likely to have less severe cultural, visual, and biological resources impacts but greater noise and land use (agricultural lands) impacts than the proposed site. The Private Land Alternative presents an additional challenge: its northern section is made up of approximately 64 parcels with 27 separate landowners and the southern portion is made up of 45 parcels with 22 separate landowners. Due to the number of parcels that would have to be acquired, obtaining site control would be more challenging than at the proposed site where BLM is the only land management entity. In addition, detailed site engineering and transmission interconnection would require additional time for this site to be developed; as a result this alternative would not meet the project objective requiring that a decision to be made in 2010. (Ex. 300, p B.2-19 – B.2-49.)

6. No Project Alternative

CEQA requires an evaluation of the "No Project" alternative "… to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project." [14 Cal. Code Regs., § 15126.6(e)(1).] The "No Project" analysis assumes that baseline environmental conditions would not change because the project would not be constructed, and that the events or actions reasonably expected to occur in the foreseeable future would occur if the project were not approved.

If the "no project" alternative were selected, the construction and operational impacts of the CSP project would not occur. There would be no grading of the site, no loss or disturbance of approximately 4,600 acres of desert habitat, and no installation of extensive power generation and transmission equipment. The "no project" alternative would also eliminate contributions to cumulative impacts in the project viewshed. It is the environmentally preferred alternative.

In the absence of the CSP project, however, other power plants, both renewable and nonrenewable, would have to be constructed to serve the demand for electricity. If the "no project" alternative were chosen, other solar renewable power plants may be built, and the impacts to the environment would likely be similar to those of the proposed project because solar renewable technologies require large amounts of land and similar slope and solarity requirements as the proposed CSP project. The "no project" alternative may also lead to development

of other non-solar renewable technologies to help achieve the California Renewable Portfolio Standard.

Additionally, if the “no project” alternative were chosen, it is likely that additional gas-fired power plants would be built or that existing gas-fired plants could operate longer. If the project were not built, California would not benefit from the reduction in greenhouse gases that this facility would provide. SCE would not receive the 663.5 MW contribution to its renewable state-mandated energy portfolio. (Ex. 300, p. B.2-14.)

Eliminated alternatives of special note

Although eliminated from further consideration during the screening analysis, two alternatives deserve additional discussion because they were specifically advanced in testimony or comments as viable alternatives. They are distributed solar generation and conservation and demand side management.

a. Distributed Solar Technology

Distributed solar generation is generally considered to use PV technology, but at slightly larger scales, distributed solar can also be implemented using solar thermal technologies.

Rooftop Solar Systems. A distributed solar photovoltaic (PV) alternative would consist of PV panels that would absorb solar radiation and convert it directly to electricity. The PV panels could be installed on residential, commercial, or industrial building rooftops or in other disturbed areas. In order to be a viable alternative to this project, there would have to be a sufficient number of panels to provide 650 MW of capacity.

California currently has over 500 MW of distributed solar PV systems which cover over 40 million square feet (CPUC 2009). During 2008, 158 MW of distributed solar PV was installed in California, doubling the amount installed in 2007 (78 MW), and with 78 MW installed through May 2009, installation data suggests that at least the same amount of MW could be installed in 2009 as in 2008 (CPUC 2009).

Distributed Solar Thermal Systems. Solar thermal technology, specifically Concentrated Solar Power (CSP) technology, has also been adapted for use at distributed locations. This technology uses small, flat mirrors which track the sun

and reflect the heat to tower-mounted receivers that boil water to create superheated steam.

Installations of 850 MW distributed solar PV would require up to 255 million square feet (approximately 5,700 acres). Distributed solar PV is assumed to be located on already existing structures or disturbed areas so little to no new ground disturbance would be required and there would be few associated biological impacts. Minimal grading or new access roads would be required and relatively minimal maintenance and washing of the solar panels would be required. It is unlikely that the rooftop solar PV alternative would create erosion impacts. Relatively large amounts of water would be required to wash the solar panels, especially with larger commercial rooftop solar installations; however, the commercial facilities would likely already be equipped with drainage systems. Therefore, the wash water would not contribute to runoff or to erosion.

Because most PV panels are black to absorb sun, rather than mirrored to reflect it, glare would not create visual impacts as with the power tower, Fresnel, and trough technologies. Additionally, the distributed solar PV alternative would not require the additional operational components, such as dry-cooling towers, substations, transmission interconnection, maintenance and operation facilities with corresponding visual impacts. Solar PV panels would be visible to passing residents and may be viewed by a larger number of people.

The rate of PV manufacturing and installation is expected to continue to grow very quickly. However, given that there are currently only about 500 MW of distributed solar PV in California, the addition of an additional 850 MW to eliminate the need for the Calico Solar Project cannot be guaranteed. This would require an even more aggressive deployment of PV at more than double the historic rate of solar PV than the California Solar Initiative program currently employs. Challenges to an accelerated implementation of distributed solar PV include:

- **RETI Consideration of Subsidies, Tariffs, Cost, and Manufacturing.** The RETI Discussion Draft Paper *California's Renewable Energy Goals – Assessing the Need for Additional Transmission Facilities* published with the RETI Final Phase 2A Report (September 2009), addresses the likelihood of a scenario of sufficient distributed solar PV to remove the need for utility scale renewable development. This discussion paper identified the factors likely to influence the pace of large scale deployment of distributed solar PV: subsidies, feed-in tariffs, manufacturing and installation cost, and manufacturing scale-up.

- **Cost.** The 2009 IEPR states that solar PV technology has shown dramatic cost reductions since 2007, and is expected to show the most improvement of all the technologies evaluated in the 2009 IEPR model, bringing its capital cost within range of that of natural gas–fired combined cycle units. However, the CPUC *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results* considered a number of cases to achieve a 33% RPS standard. The results of this study state that the cost of a high distributed generation case is significantly higher than the other 33% RPS alternative cases. The study explains that this is due to the heavy reliance on solar PV resources which are more expensive than wind and central station solar.
- **Tariffs.** Additionally, the IEPR discusses the need to adjust feed-in tariffs to keep downward pressure on costs. Feed-in tariffs should be developed based on the size and type of renewable resources, given that the cost of generating energy from a 100 MW wind farm is less than the cost of generating to ensure a good mix of new renewable energy projects. According to the report, differentiating feed-in tariffs by type and size can ensure a good mix of new renewable energy projects and avoid paying too much for some technologies and too little for others.
- **Limited Installations**. Examples of large scale distributed solar projects are still limited. In the spring of 2008, SCE proposed 250 to 500 MW of rooftop solar PV to be installed in 5 years. As of January 2010, SCE had installed only 3 MW. As the 2009 IEPR points out, the potential for distributed resources remains largely untapped and integrating large amounts of distributed renewable generation on distribution systems throughout the State presents challenges.
- **Electric Distribution System**. The State's electric distribution systems are not designed to easily accommodate large quantities of randomly installed distributed generation resources at customer sites. Accomplishing this objective efficiently and cost-effectively will require the development of a new transparent distribution planning framework.

(Ex. 300, pp. B.2-66 to B.2-69.)

Conservation and Demand-Side Management. Conservation and demand-side management consists of a variety of approaches to reduction of electricity use, including energy efficiency and conservation, building and appliance standards, and load management and fuel substitution. Energy efficiency helped flatten the state's per capita electricity use and saved consumers more than $56 billion between 1978 and 2005. However, with population growth, increasing demand for energy, and the need to reduce greenhouse gases, there is a greater need for energy efficiency.

Conservation and demand-side management is important for California's energy future and cost effective energy efficiency is considered as the resource of first choice for meeting California's energy needs. However, with population growth and increasing demand for energy, conservation and demand-management alone is not sufficient to address all of California's energy needs. Additionally, it will not provide the renewable energy required to meet the California Renewable Portfolio Standard requirements. (Ex. 300, p. B.2-84.)

FINDINGS OF FACT

Based upon the evidence, we find and conclude as follows:

1. The record contains an acceptable analysis of a reasonable range of site location and generation alternatives to the project as proposed.
2. The Reduced Acreage Alternative would reduce many of the impacts of the proposed project, but in doing so itt would also reduce the project's benefits of replacing fossil fuel fired generation and reducing associated criteria pollutant and greenhouse gas emissions.
3. The Private Lands alternative, while reducing the biological, cultural, and visual impacts of the proposed project, would have greater land use and noise impacts and be difficult to implement in the time desired due to the need to assemble upwards of 100 separate parcels with nearly 50 separate owners.
4. The No Project alternative is the environmentally superior alternative. It fails, however, to achieve the project objectives.
5. None of the site location or other alternatives to the project offer a superior alternative in terms of feasibly meeting project objectives and reducing its significant environmental impacts.

CONCLUSION OF LAW

1. The record contains a sufficient analysis of Alternatives and complies with the requirements of the California Environmental Quality Act, the Warren-Alquist Act, and their respective regulations.

No Conditions of Certification are required for this topic.

III. COMPLIANCE AND CLOSURE

Public Resources Code section 25532 requires the Commission to establish a post-certification monitoring system. The purpose of this requirement is to assure that certified facilities are constructed and operated in compliance with applicable laws, ordinances, regulations, standards, as well as the specific Conditions of Certification adopted as part of this Decision.

SUMMARY OF THE EVIDENCE

The record contains a full explanation of the purposes and intent of the Compliance Plan (Plan). The Plan is the administrative mechanism used to ensure that the Calico Solar Project is constructed and operated according to the Conditions of Certification. It essentially describes the respective duties and expectations of the Project Owner and the Staff Compliance Project Manager (CPM) in implementing the design, construction, and operation criteria set forth in this Decision.

Compliance with the Conditions of Certification contained in this Decision is verified through mechanisms such as periodic reports and site visits. The Plan also contains requirements governing the planned closure, as well as the unexpected temporary and unexpected permanent closure, of the Project. The Compliance Plan will be integrated with a U.S. Bureau of Land Management (BLM) Compliance Monitoring Plan (hereafter referred to as the Compliance Plan) to assure compliance with the terms and conditions of any approved Right-of-Way (ROW) grant including the approved Plan of Development (POD)

The Compliance Plan is composed of two broad elements. The first element establishes the "General Conditions," which:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- set forth procedures for settling disputes and making post-certification changes;
- set forth the requirements for periodic compliance reports and other administrative procedures necessary to verify the compliance status of all Commission imposed Conditions; and
- set forth requirements for facility closure.

The second general element of the Plan contains the specific "Conditions of Certification." These are found following the summary and discussion of each individual topic area in this Decision. The individual Conditions contain the measures required to mitigate potentially adverse Project impacts associated with construction, operation, and closure to levels of insignificance. Each Condition also includes a verification provision describing the method of assuring that the Condition has been satisfied.

The contents of the Compliance Plan are intended to be implemented in conjunction with any additional requirements contained in the individual Conditions of Certification.

FINDINGS OF FACT

The record establishes:

1. Requirements contained in the Compliance Plan and in the specific Conditions of Certification are intended to be implemented in conjunction with one another.

2. We adopt the following Compliance Plan as part of this Decision.

CONCLUSIONS OF LAW

1. The compliance and monitoring provisions incorporated as a part of this Decision satisfy the requirements of Public Resources Code section 25532.

2. The Compliance Plan and the specific Conditions of Certification contained in this Decision assure that the Calico Solar Project will be designed, constructed, operated, and closed in conformity with applicable law.

3. Conditions of Certification referred to herein serve the purpose of both the Energy Commission's Conditions of Certification for purposes of the California Environmental Quality Act (CEQA) and BLM's Mitigation Measures for purposes of the National Environmental Policy Act (NEPA).

GENERAL CONDITIONS OF CERTIFICATION

DEFINITIONS

The following terms and definitions are used to establish when Conditions of Certification are implemented.

BLM AUTHORIZED OFFICER:

The BLM Authorized Officer for the Project is the BLM Needles Field Manager or his designated Compliance Inspector that is responsible for oversight and inspection of all construction and operational related activities on public land.

PRE-CONSTRUCTION SITE MOBILIZATION

Site mobilization is limited preconstruction activities at the site to allow for the installation of fencing, construction trailers, construction trailer utilities, and construction trailer parking at the site. Limited ground disturbance, grading, and trenching associated with the above mentioned pre-construction activities is considered part of site mobilization. Walking, driving or parking a passenger vehicle, pickup truck and light vehicles is allowable during site mobilization.

CONSTRUCTION

Onsite work to install permanent equipment or structures for any facility.

Ground Disturbance

Construction-related ground disturbance refers to activities that result in the removal of top soil or vegetation at the site beyond site mobilization needs, and for access roads and linear facilities.

Grading, Boring, and Trenching

Construction-related grading, boring, and trenching refers to activities that result in subsurface soil work at the site and for access roads and linear facilities, e.g., alteration of the topographical features such as leveling, removal of hills or high spots, moving of soil from one area to another, and removal of soil.

Notwithstanding the definitions of ground disturbance, grading, boring and trenching above, construction does not include the following:

1. the installation of environmental monitoring equipment;
2. a soil or geological investigation;
3. a topographical survey;
4. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; and
5. any work to provide access to the site for any of the purposes specified in “Construction” 1, 2, 3, or 4 above.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, “commercial operation” begins after the completion of start-up and commissioning, when each of the power plants has reached reliable steady-state production of electricity at the rated capacity. At the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

BLM’S AUTHORIZED OFFICER AND COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

BLM’s Authorized Officer (AO) and the Compliance Project Manager (CPM) shall oversee the compliance monitoring and is responsible for:

1. Ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of BLM’s ROW Grant and the Energy Commission Decision
2. Resolving complaints
3. Processing post-certification changes to the conditions of certification, project description (petition to amend), and ownership or operational control (petition for change of ownership) (See instructions for filing petitions)
4. Documenting and tracking compliance filings
5. Ensuring that compliance files are maintained and accessible

BLM’s AO is the contact person for BLM and will consult with appropriate responsible agencies, Energy Commission, and Energy Commission staff when handling disputes, complaints, and amendments. The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies, BLM, Energy Commission, and Energy Commission staff when handling disputes, complaints, and amendments.

All project compliance submittals are submitted to BLM’s AO and the CPM for processing. Where a submittal required by a condition of certification requires BLM’s AO and/or CPM approval, the approval will involve all appropriate BLM personnel, Energy Commission staff and management. All submittals must include searchable electronic versions (pdf or word files).

CHIEF BUILDING OFFICIAL RESPONSIBILITIES

The Chief Building Official (CBO) shall serve as BLM's and the Energy Commission's delegate to assure the project is designed and constructed in accordance with BLM's Right-of-Way Grant, the Energy Commission's Decision including Conditions of Certification, California Building Standards Code, local building codes and applicable laws, ordinances, regulations and standards to ensure health and safety. The CBO is typically made-up of a team of specialists covering civil, structural, mechanical and electrical disciplines whose duties include the following:

1. Performing design review and plan checks of all drawings, specifications and procedures;
2. Conducting construction inspection;
3. Functioning as BLM's and the Energy Commission's delegate including reporting noncompliance issues or violations to the BLM Authorized Officer for action and taking any action allowed under the California Code of Regulations, including issuing a Stop Work Order, to ensure compliance;
4. Exercising access as needed to all project owner construction records, construction and inspection procedures, test equipment and test results; and
5. Providing weekly reports on the status of construction to BLM's Authorized Officer and the CPM.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

BLM's AO and the CPM shall schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings is to assemble BLM's, the Energy Commission's and project owner's technical staff and construction contractor to review the status of all pre-construction or pre-operation requirements, contained in BLM's and the Energy Commission's conditions of certification. This is to confirm that all applicable conditions of certification have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings ensure, to the extent possible, that BLM and Energy Commission conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

BLM AND ENERGY COMMISSION RECORD

BLM and the Energy Commission shall maintain the following documents and information as a public record, in either the Energy Commission's Compliance file or Dockets file, for the life of the project (or other period as required):

- All documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
- All monthly and annual compliance reports filed by the project owner;
- All complaints of noncompliance filed with BLM and the Energy Commission; and
- All petitions/requests for project or condition of certification changes and the resulting BLM, Energy Commission staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

The project owner is responsible for ensuring that the compliance conditions of certification and all other conditions of certification that appear in BLM's ROW Grant and the Energy Commission Decision are satisfied. The compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, conditions of certification, or ownership.

Failure to comply with any of the conditions of certification or the compliance conditions may result in reopening of the case and revocation of the Energy Commission certification; an administrative fine; or other action as appropriate. A summary of the Compliance Conditions of Certification is included as Compliance Table 1 at the conclusion of this section. The BLM ROW grant holder will comply with the terms, conditions, and special stipulations of the ROW grant. Failure to comply with applicable laws or regulations or any of the terms and conditions of a BLM ROW grant may result in the suspension or termination of the ROW grant (43 CFR 2807.17). Prior to suspending or terminating a ROW grant, BLM will provide written notice to the holder stating it intends to suspend or terminate and will provide reasonable opportunity to correct any noncompliance.

COMPLIANCE MITIGATION MEASURES/CONDITIONS OF CERTIFICATION

UNRESTRICTED ACCESS (COMPLIANCE-1)

BLM's AO, responsible BLM staff, the CPM, responsible Energy Commission staff, and delegated agencies or consultants shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on-site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although BLM's AO and the CPM will normally schedule site visits on dates and times agreeable to the project owner, BLM's AO and the CPM reserve the right to make unannounced visits at any time.

COMPLIANCE RECORD (COMPLIANCE-2)

The project owner shall maintain project files on-site or at an alternative site approved by BLM's AO and the CPM for the life of the project, unless a lesser period of time is specified by the conditions of certification. The files shall contain copies of all "as-built" drawings, documents submitted as verification for conditions, and other project-related documents. As-built drawings of all facilities including linear facilities shall be provided to the BLM AO for inclusion in the BLM administrative record within 90-days of completion of that portion of the facility or project.

BLM and Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this condition.

COMPLIANCE VERIFICATION SUBMITTALS (COMPLIANCE-3)

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission's procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified as necessary by BLM's AO and the CPM.

Verification of compliance with the conditions of certification can be accomplished by the following:

1. Monthly and/or annual compliance reports, filed by the project owner or authorized agent, reporting on work done and providing pertinent documentation, as required by the specific conditions of certification;
2. Appropriate letters from delegate agencies verifying compliance;
3. BLM and Energy Commission staff audits of project records; and/or
4. BLM and Energy Commission staff inspections of work, or other evidence that the requirements are satisfied.

Verification lead times associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. The cover letter subject line shall identify the project by AFC number, the appropriate condition(s) of certification by condition number(s), and a brief description of the subject of the submittal. The project owner shall also identify those submittals not required by a condition of certification with a statement such as: “This submittal is for information only and is not required by a specific condition of certification.” When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal and BLM/CEC submittal number.

The project owner is responsible for the delivery and content of all verification submittals to the BLM’s AO and CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All hardcopy submittals shall be addressed to each of the following:

BLM’s Authorized Officer	**Mary Dyas**
(CACA-049537 and CACA-049539)	**(08-AFC-13C)**
U.S. Bureau of Land Management	**California Energy Commission**
2601 Barstow Road	**1516 Ninth Street, MS-2000**
Barstow, CA 92311	**Sacramento, CA 95814**

Those submittals shall be accompanied by a searchable electronic copy, on a CD or by e-mail, as agreed upon by BLM’s AO and the CPM.

If the project owner desires BLM and/or Energy Commission staff action by a specific date, that request shall be made in the submittal cover letter and shall include a detailed explanation of the effects on the project if that date is not met.

PRE-CONSTRUCTION MATRIX AND TASKS PRIOR TO START OF CONSTRUCTION (COMPLIANCE-4)

Prior to commencing construction, a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to BLM’s AO and the CPM. This matrix will be included with the project

owner's first compliance submittal or prior to the first pre-construction meeting, whichever comes first. It will be submitted in the same format as the compliance matrix described below. In order to begin any on-site mobilization or surface disturbing activities on public land, the BLM AO must approve a written Notice to Proceed (NTP). NTPs will be phased as appropriate to facilitate timely implementation of construction.

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and BLM's AO and the CPM has issued a letter and BLM has issues a NTP to the project owner authorizing construction. Various lead times for submittal of compliance verification documents to BLM's AO and the CPM for conditions of certification are established to allow sufficient BLM and Energy Commission staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project development.

If the project owner anticipates commencing project construction as soon as the project is certified, it may be necessary for the project owner to file compliance submittals prior to project certification. Compliance submittals should be completed in advance where the necessary lead time for a required compliance event extends beyond the date anticipated for start of construction. The project owner must understand that the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change, based upon BLM's ROW Grant and the Energy Commission Decision.

Compliance Reporting

There are two different compliance reports that the project owner must submit to assist BLM's AO and the CPM in tracking activities and monitoring compliance with the terms and conditions of BLM's ROW Grant and the Energy Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to BLM's AO and the CPM in the monthly or annual compliance reports.

POSTING OF A SURETY BOND (COMPLIANCE-5)

Prior to site disturbance and each increment of construction, the project owner shall post a surety bond adequate to cover the cost of decommissioning and restoration, including the removal of the project features that have been constructed for that that portion of the site and restoring the native topography and vegetation. An "increment of construction" shall mean a significant feature of construction, such as site grading, a building, a fluid storage tank, a water treatment facility, a hydrogen production facility, a switchyard, or a group of solar collectors connected to an electrical transformer (including that transformer). This Surety bond will apply to all site disturbance features.

The project owner shall provide the surety bond to the BLM AO for approval and to the CPM for review with written evidence indicating that the surety bond is adequate to cover the cost of decommissioning and removing the project features constructed, allowing for site restoration. The written evidence shall include a valid estimate showing that the amount of the bond is adequate to accomplish such work. The timing for the submittal of the surety bond and approval of this document shall be coordinated with the BLM AO and CPM. Over the life of the project, the surety bond will be updated as necessary to account for any changes to the project description and/or decommissioning costs.

COMPLIANCE MATRIX (COMPLIANCE-6)

A compliance matrix shall be submitted by the project owner to BLM's AO and the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide BLM's AO and the CPM with the current status of all conditions of certification in a spreadsheet format. The compliance matrix must identify:

1. the technical area;
2. the condition number;
3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Chief Building Official (CBO), BLM's AO, CPM, or delegate agency, if applicable; and
7. the compliance status of each condition, e.g., "not started," "in progress" or "completed" (include the date).
8. if the condition was amended, the date of the amendment.

Satisfied conditions shall be placed at the end of the matrix.

MONTHLY COMPLIANCE REPORT (COMPLIANCE-7)

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date upon which the project was approved, unless otherwise agreed to by BLM's AO and the CPM. The first Monthly Compliance Report shall include the AFC number and an initial list of dates for each of the events identified on the Key Events List. The Key Events List Form is found at the end of this section.

During pre-construction and construction of each power plant, the project owner or authorized agent shall submit an original and an electronic searchable version of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. A summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;

2. Documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, as well as the conditions they satisfy and submitted as attachments to the Monthly Compliance Report;
3. An initial, and thereafter updated, compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);
4. A list of conditions that have been satisfied during the reporting period, and a description or reference to the actions that satisfied the condition;
5. A list of any submittal deadlines that were missed, accompanied by an explanation and an estimate of when the information will be provided;
6. A cumulative listing of any approved changes to conditions of certification;
7. A listing of any filings submitted to, or permits issued by, other governmental agencies during the month;
8. A projection of project compliance activities scheduled during the next two months. The project owner shall notify BLM's AO and the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
9. A listing of the month's additions to the on-site compliance file; and
10. A listing of complaints, notices of violation, official warnings, and citations received during the month, a description of the resolution of the resolved actions, and the status of any unresolved actions.

All sections, exhibits, or addendums shall be separated by tabbed dividers or as acceptable by BLM's AO and the CPM.

ANNUAL COMPLIANCE REPORT (COMPLIANCE-8)

After construction of each power plant is complete or when a power plant goes into commercial operations, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to BLM's AO and the CPM each year at a date agreed to by BLM's AO and the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by BLM's AO and the CPM. Each Annual Compliance Report shall include the AFC number, identify the reporting period and shall contain the following:

1. An updated compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);
2. A summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. Documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter,

with the condition it satisfies, and submitted as attachments to the Annual Compliance Report;

4. A cumulative listing of all post-certification changes by the Energy Commission or changes to the BLM ROW grant or approved POD by BLM , or cleared by BLM's AO and the CPM;
5. An explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. A listing of filings submitted to, or permits issued by, other governmental agencies during the year;
7. A projection of project compliance activities scheduled during the next year;
8. A listing of the year's additions to the on-site compliance file;
9. An evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date [see Compliance Conditions for Facility Closure addressed later in this section]; and
10. A listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved matters, and the status of any unresolved matters.

CONFIDENTIAL INFORMATION (COMPLIANCE-9)

Any information that the project owner deems confidential shall be submitted to the Energy Commission's Executive Director with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information that is determined to be confidential shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

Any information the ROW holder deems confidential shall be submitted to the BLM AO with a written request for said confidentiality along with a justification for the request. All confidential submissions to BLM should be clearly stamped "proprietary information" by the holder when submitted.

ANNUAL ENERGY FACILITY COMPLIANCE FEE (COMPLIANCE-10)

Pursuant to the provisions of Section 25806(b) of the Public Resources Code, the project owner is required to pay an annual compliance fee, which is adjusted annually. Current Compliance fee information is available on the Energy Commission's website http://www.energy.ca.gov/siting/filing_fees.html. You may also contact the CPM for the current fee information. The initial payment is due on the date the Energy Commission adopts the final decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification. The payment instrument shall be made payable to the California Energy Commission and mailed to: Accounting Office MS-02, California Energy Commission, 1516 9th St., Sacramento, CA 95814.

REPORTING OF COMPLAINTS, NOTICES, AND CITATIONS (COMPLIANCE-11)

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact

project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering with date and time stamp recording. All recorded complaints shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during construction and operation. The telephone number shall be provided to BLM's AO and the CPM who will post it on the Energy Commission's web page at:

http://www.energy.ca.gov/sitingcases/power_plants_contacts.html.

Any changes to the telephone number shall be submitted immediately to BLM's AO and the CPM, who will update the web page.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies to BLM's AO and the CPM of all complaint forms, including noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A).

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to implement the Closure, Revegetation and Restoration Plan to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure. Closure would be conducted in accordance with Condition of Certification **BIO-14** that requires the project owner to develop and implement a Closure, Revegetation and Rehabilitation Plan.

There are at least three circumstances in which a facility closure can take place: planned closure, unplanned temporary closure and unplanned permanent closure.

CLOSURE DEFINITIONS

Planned Closure

A planned closure occurs when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

Unplanned Temporary Closure

An unplanned temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a

natural disaster or an emergency. Short-term is defined as cessation of construction activities or operations of a power plant for a period less than 6-months long. Cessation of construction of operations for a period longer than 6 months in considered a permanent closure.

Unplanned Permanent Closure

An unplanned permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unplanned closure where the owner implements the on-site contingency plan. It can also include unplanned closure where the project owner fails to implement the contingency plan, and the project is essentially abandoned.

COMPLIANCE CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE (COMPLIANCE-11)

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a revision or update to the approved Closure, Revegetation and Rehabilitation Plan to BLM and the Energy Commission for review and approval at least 12 months (or other period of time agreed to by BLM's AO and the CPM) prior to commencement of closure activities. The project owner shall file 50 copies and 50 CDs with the Energy Commission and 10 copies and 10 CDs with BLM (or other number of copies agreed upon by BLM's AO and the CPM) of a proposed facility closure plan/Closure, Revegetation and Rehabilitation Plan.

The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related materials that must be removed from the site;
2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
3. address conformance of the plan with all applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of facility closure, and applicable conditions of certification; and.
4. Address any changes to the site revegetation, rehabilitation, monitoring and long-term maintenance specified in the existing plan that are needed for site revegetation and rehabilitation to be successful.

Prior to submittal of an amended or revised Closure, Revegetation and Restoration Plan, a meeting shall be held between the project owner, BLM's AO and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.

In the event that there are significant issues associated with the proposed facility Closure, Revegetation and Restoration plan's approval, or the desires of local officials

or interested parties are inconsistent with the plan, BLM's AO the CPM shall hold one or more workshops and/or BLM and the Energy Commission may hold public hearings as part of its approval procedure.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities until BLM and the Energy Commission approves the facility Closure, Revegetation and Restoration plan.

UNPLANNED TEMPORARY CLOSURE/ON-SITE CONTINGENCY PLAN (COMPLIANCE-12)

In order to ensure that public health and safety and the environment are protected in the event of an unplanned temporary facility closure, it is essential to have an On-Site Contingency Plan in place. The On-Site Contingency Plan will help to ensure that all necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.

The project owner shall submit an On-Site Contingency Plan for BLM's AO and CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by BLM's AO and the CPM) after approval of any NTP or letter granting approval to commence construction for each phase of construction. A copy of the approved plan must be in place during commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with BLM's AO and the CPM, will update the On-Site Contingency Plan as necessary. BLM's AO and the CPM may require revisions to the On-Site Contingency Plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the On-Site Contingency Plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by BLM's AO and the CPM.

The On-Site Contingency Plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by BLM's AO and the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment. (Also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management.)

In addition, consistent with requirements under unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the On-Site Contingency Plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unplanned temporary closure, the project owner shall notify BLM's AO and the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the On-Site Contingency Plan.

The project owner shall keep BLM's AO and the CPM informed of the circumstances and expected duration of the closure.

If BLM's AO and the CPM determine that an unplanned temporary closure is likely to be permanent, or for a duration of more than 6 months, a Closure Plan consistent with the requirements for a planned closure shall be developed and submitted to BLM's AO and the CPM within 90 days of BLM's AO and the CPM's determination (or other period of time agreed to by BLM's AO and the CPM).

UNPLANNED PERMANENT CLOSURE/ON-SITE CONTINGENCY PLAN (COMPLIANCE-13)

The On-Site Contingency Plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned permanent closure.

In addition, the On-Site Contingency Plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the event of abandonment.

In the event of an unplanned permanent closure, the project owner shall notify BLM's AO and the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the On-Site Contingency Plan. The project owner shall keep BLM's AO and the CPM informed of the status of all closure activities.

To ensure that public health and safety and the environment are protected in the event of an unplanned permanent closure, the project owner shall submit an On-Site Contingency Plan no less than 60 days after a NTP is issued for each phase of development.

POST CERTIFICATION CHANGES TO BLM'S ROW GRANT AND/OR THE ENERGY COMMISSION DECISION: AMENDMENTS, OWNERSHIP CHANGES, STAFF APPROVED PROJECT MODIFICATIONS AND VERIFICATION CHANGES (COMPLIANCE-14)

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify the project (including linear facilities) design, operation or performance requirements, and to transfer ownership or operational control of the facility. The BLM ROW holder must file a written request in the form of an application to the BLM AO in order to change the terms and conditions of their ROW grant or POD. Written requests will be in a manner prescribed by the BLM AO.

It is the responsibility of the project owner to contact BLM's AO and the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769. Implementation of a project modification without first securing BLM and either Energy Commission or Energy Commission staff approval, may result in enforcement action that could result in civil penalties in accordance with section 25534 of the Public Resources Code.

A petition is required for amendments and for staff approved project modifications as specified below. Both shall be filed as a “Petition to Amend.” Staff will determine if the change is significant or insignificant. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to BLM’s AO and the CPM, who will file it with the Energy Commission’s Dockets Unit in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of approval and the process that applies are explained below. They reflect the provisions of Section 1769 at the time this condition was drafted. If the Commission’s rules regarding amendments are amended, the rules in effect at the time an amendment is requested shall apply.

Amendment

The project owner shall petition the Energy Commission, pursuant to Title 20, California Code of Regulations, Section 1769(a), when proposing modifications to the project (including linear facilities) design, operation, or performance requirements. If a proposed modification results in deletion or change of a condition of certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations or standards, the petition will be processed as a formal amendment to the Energy Commission’s final decision, which requires public notice and review of the BLM-Energy Commission staff analysis, and approval by the full Energy Commission. The petition shall be in the form of a legal brief and fulfill the requirements of Section 1769(a). Upon request, the CPM will provide you with a sample petition to use as a template.

The ROW holder shall file an application to amend the BLM ROW grant for any substantial deviation or change in use. The requirements to amend a ROW grant are the same as when filing a new application including paying processing and monitoring fees and rent.

Staff Approved Project Modification

Modifications that do not result in deletions or changes to conditions of certification, and that are compliant with laws, ordinances, regulations and standards may be authorized by BLM’s AO and the CPM as a staff approved project modification (SAPM) pursuant to section 1769(a) (2). Once staff files an intention to approve the proposed project modifications, any person may file an objection to staff’s determination within 14 days of service on the grounds that the modification does not meet the criteria of section 1769 (a)(2). If a person objects to staff’s determination, the petition must be processed as a formal amendment to the decision and must be approved by the full commission at a noticed business meeting or hearing. BLM and the Energy Commission intend to integrate a process to jointly approve SAPMs to avoid duplication of approval processes and ensure appropriate documentation for the public record.

Change of Ownership

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769(b). This process requires public notice and approval by the full Commission and BLM. The petition shall be in the form of a legal brief and

fulfill the requirements of Section 1769(b). Upon request, the CPM will provide you with a sample petition to use as a template. The transfer of ownership of a BLM ROW grant must be through the filing of an application for assignment of the grant.

Verification Change

A verification may be modified by BLM's AO and the CPM without requesting an amendment to the ROW Grant or Energy Commission decision if the change does not conflict with the conditions of certification and provides an effective alternate means of verification.

CBO DELEGATION AND AGENCY COOPERATION

In performing construction and operation monitoring of the project, BLM and Energy Commission staff act as, and have the authority of, the Chief Building Official (CBO). BLM and Energy Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. BLM and the Energy Commission intend to avoid duplication by integrating the responsibilities of the CBO with those of a BLM compliance inspector and will work jointly in the selection of a CBO. BLM and Energy Commission staff retain CBO authority when selecting a delegate CBO, including enforcing and interpreting federal, state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

BLM and Energy Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental protection when conducting project monitoring.

ENFORCEMENT

BLM's legal authority to enforce the terms and conditions of its ROW Grant is specified in 43 CFR 2807.16 to 2807.19. BLM may issue an immediate temporary suspension of activities it they determine a holder has violated one or more of the terms, conditions, or stipulation of the grant. BLM may also suspend or terminate a ROW grant if a holder does not comply with applicable laws and regulation or any terns, conditions, or special stipulations contained in the grant. Prior to suspending or terminating a ROW grant, BLM will provide written notice to the holder stating it intends to suspend or terminate and will provide reasonable opportunity to correct any noncompliance.

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider.

ENERGY COMMISSION NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1237, but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by future law or regulations.

The Energy Commission has established a toll free compliance telephone number of 1-800-858-0784 for the public to contact the Energy Commission about power plant construction or operation-related questions, complaints or concerns.

Informal Dispute Resolution Process

The following procedure is designed to informally resolve disputes concerning the interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate an informal dispute resolution process. Disputes may pertain to actions or decisions made by any party, including the Energy Commission's delegate agents.

This process may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1237, but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The process encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be brought before the full Energy Commission for consideration via the complaint and investigation procedure.

Request for Informal Investigation

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner, BLM and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM find that further investigation is necessary, the project owner will be asked to promptly investigate the matter. Within seven working days of the CPM's request, provide a written report to the CPM of the results of the investigation, including corrective measures proposed or undertaken. Depending on the urgency of the noncompliance matter, the CPM may

conduct a site visit and/or request the project owner to also provide an initial verbal report, within 48 hours.

Request for Informal Meeting

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures proposed or undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within 14 days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. secure the attendance of appropriate Energy Commission staff and staff of any other agencies with expertise in the subject area of concern, as necessary;
3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner;
4. After the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum that fairly and accurately identifies the positions of all parties and any understandings reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et seq.

Formal Dispute Resolution Procedure-Complaints and Investigations

Any person may file a complaint with the Energy Commission's Dockets Unit alleging noncompliance with a Commission decision adopted pursuant to Public Resources Code section 25500. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1237.

PROJECT:

DOCKET #:

COMPLIANCE PROJECT MANAGER:

BLM AUTHORIZED OFFICER:

EVENT DESCRIPTION	DATE
Certification Date	
Obtain Site Control	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Obtain Building Occupation Permit	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
Synchronization with Grid and Interconnection	
Complete T/L Construction	
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction and Interconnection	
Complete Gas Pipeline Construction	
WATER SUPPLY LINE ACTIVITIES	
Start Water Supply Line Construction	
Complete Water Supply Line Construction	

COMPLIANCE TABLE 1
SUMMARY of COMPLIANCE CONDITIONS OF CERTIFICATION

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-1	**Unrestricted Access**	The project owner shall grant BLM and Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COMPLIANCE-2	**Compliance Record**	The project owner shall maintain project files on-site. BLM and Energy Commission staff and delegate agencies shall be given unrestricted access to the files.
COMPLIANCE-3	**Compliance Verification Submittals**	The project owner is responsible for the delivery and content of all verification submittals to BLM's Authorized Officer and the CPM, whether such condition was satisfied by work performed or the project owner or his agent.
COMPLIANCE-4	**Pre-construction Matrix and Tasks Prior to Start of Construction**	• Construction shall not commence until the all of the following activities/submittals have been completed: property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns, a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction, all pre-construction conditions have been complied with, BLM's Authorized Officer and the CPM have issued a letter to the project owner authorizing construction.
COMPLIANCE-5	**Posting of A Surety Bond**	The project owner shall post a surety bond adequate to cover the cost of decommissioning and restoration including the removal of the project features that have been constructed for that that portion of the site and restoring the native topography and vegetation.

COMPLIANCE TABLE 1
SUMMARY of COMPLIANCE CONDITIONS OF CERTIFICATION

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-6	**Compliance Matrix**	The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance conditions of certification.
COMPLIANCE-7	**Monthly Compliance Report including a Key Events List**	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Energy Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List.
COMPLIANCE-8	**Annual Compliance Reports**	After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports.
COMPLIANCE-9	**Confidential Information**	Any information the project owner deems confidential shall be submitted to BLM and the Energy Commission's Dockets Unit with a request for confidentiality.
COMPLIANCE-10	**Annual Fees**	Payment of Annual Energy Facility Compliance Fee to the Energy Commission;
COMPLIANCE-11	**Reporting of Complaints, Notices and Citations**	Within 10 days of receipt, the project owner shall report to BLM's Authorized Officer and the CPM, all notices, complaints, and citations.
COMPLIANCE-12	**Planned Facility Closure**	The project owner shall submit any revisions or changes to the Closure, Revegetation and Restoration Plan to BLM's Authorized Officer and the CPM at least 12 months prior to commencement of a planned closure.

COMPLIANCE TABLE 1
SUMMARY of COMPLIANCE CONDITIONS OF CERTIFICATION

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-13	**Unplanned Temporary Facility Closure**	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an On-Site Contingency Plan no less than 60 days after a NTP is issued for each power plant.
COMPLIANCE-14	**Unplanned Permanent Facility Closure**	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an On-Site Contingency Plan no less than 60 days after a NTP is issued for each power plant.
COMPLIANCE-15	**Post-certification changes to the ROW Grant and/or Decision**	The project owner must petition the Energy Commission and file an application to amend the ROW grant to delete or change a condition of certification, modify the project design or operational requirements and/or transfer ownership of operational control of the facility.

Complaint Log Number:_____ Docket Number:_____

Project Name:_____

COMPLAINANT INFORMATION

Name:_____ Phone Number:_____

Address:_____

COMPLAINT

DATE COMPLAINT RECEIVED:_____ TIME COMPLAINT RECEIVED:_____

COMPLAINT RECEIVED BY: ☐ TELEPHONE ☐ IN WRITING (COPY ATTACHED)

DATE OF FIRST OCCURRENCE:_____

DESCRIPTION OF COMPLAINT (INCLUDING DATES, FREQUENCY, AND DURATION):_____

FINDINGS OF INVESTIGATION BY PLANT PERSONNEL:_____

DOES COMPLAINT RELATE TO VIOLATION OF BLM ROW GRANT? ☐ YES ☐ NO

DOES COMPLAINT RELATE TO VIOLATION OF A CEC REQUIREMENT? ☐ YES ☐ NO

DATE COMPLAINANT CONTACTED TO DISCUSS FINDINGS:_____

DESCRIPTION OF CORRECTIVE MEASURES TAKEN OR OTHER COMPLAINT RESOLUTION:_____

DOES COMPLAINANT AGREE WITH PROPOSED RESOLUTION?☐ YES ☐ NO

IF NOT, EXPLAIN:_____

_____

CORRECTIVE ACTION

IF CORRECTIVE ACTION NECESSARY, DATE COMPLETED:_____

DATE FIRST LETTER SENT TO COMPLAINANT (COPY ATTACHED):_____

DATE FINAL LETTER SENT TO COMPLAINANT (COPY ATTACHED):_____

OTHER RELEVANT INFORMATION:_____

_____

"This information is certified to be correct."

PLANT MANAGER SIGNATURE:_____ DATE:

(ATTACH ADDITIONAL PAGES AND ALL SUPPORTING DOCUMENTATION, AS REQUIRED)

IV. ENGINEERING ASSESSMENT

The broad engineering assessment of the Calico Solar Project consists of separate analyses that examine its facility design, engineering, efficiency, and reliability aspects. These analyses include the on-site power generating equipment and the project-related linear facilities.

A. FACILITY DESIGN

This review covers several technical disciplines including the civil, electrical, mechanical, and structural engineering elements related to project design and construction. It addresses consistency with applicable LORS, and does not extend to the project's environmental impacts under the California Environmental Quality Act (CEQA).

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Application for Certification (AFC) describes the preliminary facility design. In considering the adequacy of the plans, the Commission reviews whether the power plant and linear facilities are described with sufficient detail to assure the project can be designed and constructed in accordance with applicable engineering laws, ordinances, regulations, and standards (LORS). The review also includes, as appropriate, the identification of special design features that are necessary to deal with unique site conditions which could impact public health and safety or the operational reliability of the project. (Ex. 300, p. D.1-1.)

Staff considered potential geological hazards and reviewed the preliminary project design with respect to grading, flood protection, erosion control, site drainage, and site access in addition to the criteria for designing and constructing related linear facilities such as the transmission interconnection facilities. (Ex. 300, pp. D.1-2 to D.1-3; see also, the **Geology and Paleontology** section of this Decision.) The evidence establishes that the project will incorporate accepted industry standards. This includes design practices and construction methods for preparing and developing the site. Conditions **CIVIL-1** through **CIVIL-4** ensures that these activities will be conducted in compliance with applicable LORS.

Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production, costly or time

consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. (Ex. 300, p. D.1-3.) **Table 2**, contained in Condition **GEN-2,** lists the major structures and equipment included in the initial engineering design for the project.[1] Conditions **GEN-3** through **GEN-8** require that qualified individuals oversee and inspect construction of the facility. Similarly, Conditions **MECH-1** through **MECH-3** address compliance of the project's mechanical systems with appropriate standards, and a quality assurance/quality control program assures that the project will be designed, procured, fabricated, and installed as described. Condition **ELEC-1** provides assurance that design and construction of major electrical features will comply with applicable LORS. Compliance with design requirements will be verified through specific inspections and audits. (Ex. 300, p. D.1-4.)

Certain structures in a power plant may be required, under the building codes, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed according to their appropriate lateral force procedure, Condition of Certification **STRUC-1** requires the project CBO's review and approval of the owner's proposed lateral force procedures before construction begins. (Ex. 300, p. D.1-3.)

The Conditions of Certification establish a design review and construction inspection process to verify compliance with applicable standards and special requirements. The project will be designed and constructed in conformance with the latest edition of the California Building Standards Code (currently the 2007 CBSC) and other applicable codes and standards in effect at the time design approval and construction actually begin. Condition of Certification **GEN-1** incorporates this requirement. (Ex. 300, pp. D.1-3 to D.1-4.)

Overall, the evidentiary record conclusively establishes that the project will be designed and constructed in compliance with all applicable LORS, and that these activities will not negatively impact public health and safety.

[1] The master drawing and master specifications lists described in Condition **GEN-2** include documents based on the project's *detailed* design and may include supplemental materials for structures and equipment not currently identified in Table 1.

FINDINGS OF FACT

Based on the uncontroverted evidence, the Commission makes the following findings:

1. The Calico Solar Project is currently in the preliminary design stage.
2. The evidence summarized in this topic area addresses consistency with applicable LORS, and does not extend to an evaluation of the project's environmental impacts.
3. The facility can be designed and constructed in conformity with the applicable laws, ordinances, regulations, and standards (LORS) set forth in the appropriate portion of **Appendix A** of this Decision.
4. The Conditions of Certification set forth below provide, in part, that qualified personnel will perform design review, plan checking, and field inspections of the project.
5. The Conditions of Certification set forth below are necessary to ensure that the project is designed and constructed in accordance with applicable law and in a manner that protects public health and safety.
6. The **General Conditions,** included in the **Compliance and Closure** section of this Decision, establish requirements to be followed in the event of facility closure.

CONCLUSION OF LAW

1. We therefore conclude that implementation of the Conditions of Certification listed below ensure that the Calico Solar Project will be designed and constructed in conformance with the applicable LORS pertinent to the engineering aspects summarized in this section of the Decision.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct, and inspect the project in accordance with the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable

engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility. All transmission facilities (lines, switchyards, switching stations and substations) are covered in the Conditions of Certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2007 CBSC is in effect, the 2007 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO.

Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for CBO review, the project owner shall furnish the CPM and the CBO with a schedule of facility design submittals, and master drawing and master specifications lists. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM upon request.

Verification: At least 30 days (or a project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall

submit to the CBO and to the CPM the schedule, the master drawing and master specifications lists of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in **Facility Design Table 2**, below. Major structures and equipment shall be added to or deleted from the table only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report.

Facility Design Table 2
Major Structures and Equipment List

Equipment/System	Quantity (Plant)
SunCatcher Power Generating Unit (CT) Foundation and Connections	1 Lot
Administration Building Structure, Foundation and Connections	1
Maintenance Building Structure, Foundation and Connections	1
Assembly Building Structure, Foundation and Connections	3
Collector Group Generator Step-up Unit Transformer Foundation and Connections	1 Lot
Generator Collection Power Center	1 Lot
Generator Collection Sub-panel	1 Lot
Power Factor Capacitor	1 Lot
Open Bus Switch Rack	6
Shunt Capacitor Bank	6
Dynamic VAR Compression System	6
Disconnect Switch	15
Power Transformer Foundation and Connections	6
Coupling Capacitor Voltage Transformer Foundation and Connections	6
Diesel Power Generator Set Foundation and Connections	1
Fire Water Pump Foundation and Connections	1
Water Treatment System Foundation and Connections	1
Potable/Fire Water Tank Structure, Foundation and Connections	1
Well Water Storage Tank Structure, Foundation and Connections	1
Demineralized Water Storage Tank Structure, Foundation and Connections	2
Hydrogen Bottles Storage Area	1 Lot
Chemical Storage Area	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure and Large Diameter Piping and Pipe Racks	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
Building Energy Conservation Systems	1 Lot

Equipment/System	Quantity (Plant)
Substation, Switchboards, Transformers, Buses and Towers	1 Lot
Electrical Breakers, Cables/Duct Banks	1 Lot
Prefabricated Assemblies	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 2007 CBC, adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be otherwise agreed upon by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next monthly compliance report indicating that applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California- registered architect, or a structural or civil engineer, as the resident engineer (RE) in charge of the project. All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the Conditions of Certification in the **Transmission System Engineering** section of this Decision.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these Conditions of Certification, approved plans, and specifications;
3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the Conditions of the project;

4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests when they do not conform to approved plans and specifications.

The resident engineer (or his delegate) must be located at the project site, or be available at the project site within a reasonable period of time, during any hours in which construction takes place.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has five days to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer.

(California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in California). All transmission facilities (lines, switchyards, switching stations, and substations) are handled in the Conditions of Certification in the **Transmission System Engineering** section of this Decision.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit, to the CBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project.

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

   1. Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;

   2. Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and

   3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

   1. Review all the engineering geology reports;

2. Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement or collapse when saturated under load;
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2007 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and
4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

C. The engineering geologist shall:
   1. Review all the engineering geology reports and prepare a final soils grading report; and
   2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2007 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:
   1. Be directly responsible for the design of the proposed structures and equipment supports;
   2. Provide consultation to the RE during design and construction of the project;
   3. Monitor construction progress to ensure compliance with engineering LORS;
   4. Evaluate and recommend necessary changes in design; and
   5. Prepare and sign all major building plans, specifications, and calculations.

E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

F. The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or project owner and CBO approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO’s approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, including prefabricated assemblies, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2007 CBC. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this Decision.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Inspect the work assigned for conformance with the approved design drawings and specifications;

3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and
4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and other provisions of the applicable edition of the CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next monthly compliance report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within 5 days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next monthly compliance report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans,

specifications, and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by the CPM.

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next monthly compliance report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the CBO three sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" (Adobe .pdf 6.0) files, with restricted (password-protected) printing privileges, on archive quality compact discs.

CIVIL-1 The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils, geotechnical, or foundation investigations reports required by the 2007 CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area.

Verification: The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 2007 CBC. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following monthly compliance report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans.

Verification: Within 30 days (or project owner- and CBO-approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes, along with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next monthly compliance report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Facility Design Table 2** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and

drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 2**, above):

1. Major project structures;
2. Major foundations, equipment supports, and anchorage; and
3. Large field-fabricated tanks.

Construction of any structure or component shall not begin until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (for example, highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications;
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations, and specifications shall be signed and stamped by the responsible design engineer; and
5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS.

Verification: At least 60 days (or project owner and CBO approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in **Facility Design Table 2** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next monthly compliance report, a copy of a statement from the CBO that the proposed structural plans,

specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2007 CBC.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within 5 days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 2007 CBC, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the

transmittal letter to the CPM. The project owner shall notify the CPM, via the monthly compliance report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2007 CBC shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or project owner- and CBO-approved alternate time frame) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following monthly compliance report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the monthly compliance report following completion of any inspection.

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in **Facility Design Table 2**, Condition of Certification **GEN-2**, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards, which may include, but are not limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);

- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- San Bernardino County codes.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in **Facility Design Table 2**, Condition of Certification **GEN-2,** above, the project owner shall submit to the CBO for design review and approval the final plans, specifications, and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of that installation.

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated, and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications, and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of that construction. The final plans, specifications and calculations shall include approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 Volts or higher (see a representative list, below), with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. All transmission facilities (lines, switchyards, switching stations,

and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this Decision.

A. Final plant design plans shall include:

   1. one-line diagrams for the 13.8-kV, 4.16-kV and 480 V systems; and
   2. system grounding drawings.

B. Final plant calculations must establish:

   1. short-circuit ratings of plant equipment;
   2. ampacity of feeder cables;
   3. voltage drop in feeder cables;
   4. system grounding requirements;
   5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8-kV, 4.16-kV and 480 V systems;
   6. system grounding requirements; and
   7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the monthly compliance report:

   1. Receipt or delay of major electrical equipment;
   2. Testing or energization of major electrical equipment; and
   3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission decision.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

B. POWER PLANT EFFICIENCY

Pursuant to the California Environmental Quality Act (CEQA), the Commission must determine whether the consumption of fossil fuel (a non-renewable form of energy) will result in substantial impacts upon energy resources. (Cal. Code Regs., tit. 14 § 15126.4(a)(1), App. F.). The Calico Solar Project will not use natural gas (fossil fuel) for power generation. The project would decrease reliance on fossil fuel, and would increase reliance on renewable energy resources. The undisputed evidence establishes that the project would not create significant adverse effects on fossil fuel energy supplies or resources, would not require additional sources of energy supply, and would not consume fossil fuel energy in a wasteful or inefficient manner. (Ex. 300, p. D.3-1; 8/4/10 RT 183: 8-9.)

The evidence examines the efficiency of the Calico Solar project design and compares project efficiency to that of other solar projects. (Ex. 300, pp. D.3-1 and D.3-7.) There are no LORS that establish solar power plant efficiency criteria. (Ex. 300, p. D.3-12.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Calico Solar Project is a solar thermal power plant that will produce a total of 663.5 MW (nominal net output) and will employ the Stirling Energy Systems SunCatcher technology. The project would occupy approximately 4,613 acres of land and would consist of 26,450 SunCatchers (Ex. 1 AFC §§ 1.1, 1.3, 2.2, 3.1, 3.3; Ex. 300, p. D.3-4; Ex. 317, p. B.1-2.).

Each SunCatcher is composed of a pedestal, a mirrored dish that tracks the sun, and a power conversion unit (PCU) consisting of a solar receiver, a closed-cycle Stirling engine, and a generator that captures the solar energy and converts it to electricity. Each SunCatcher is capable of generating 25 kW of power. Power would be routed from the SunCatchers to electrical transformers, then to a switchyard located near the center of the project. (Ex.1, AFC §§ 3.1, 3.1.1, 3.4.1, 3.4.3, 3.4.4.1, 3.4.4.2; Ex. 300, p. D.3-4.).

The project will not use fossil fuel to generate electricity. Each of the 26,450 Stirling engines is filled with hydrogen gas, which acts as a working fluid that allows the engine to operate. During operation, hydrogen leaks from the engines and must be continuously replenished from a centralized hydrogen system connected to each SunCatcher., Some electricity consumption will result due to the necessity of replacing hydrogen gas that leaks from the Stirling engines. The

project will produce hydrogen gas onsite through electrolysis of water, which will consume 215 MW-hours of electrical energy per year. (Ex. 300, pp. D.3-4 to D.3-5.)

The Stirling engine that is the heart of the SunCatcher technology is cooled by an automotive-style cooling system. Waste engine heat is conducted via an enclosed cooling loop to a radiator that dumps the waste heat to the atmosphere. This is a dry cooling system; its only water consumption is that required to make up any unintended leakage from the system. Thus, we concur with Staff's determination that the cooling technology selected for this project appears optimum. (Ex. 300, p. D.3-8.)

Applicant and Staff evaluated alternative generating technologies to the proposed project. Staff independently concluded that from an energy efficiency prospective, given the project objectives, location, air pollution control requirements, and the commercial availability of various alternative technologies, that the selected solar thermal technology is a reasonable selection. This is evaluated in the **Alternatives** section of this Decision. (Ex. 300, p. D.3-6.)

1. Fossil Fuel Use - Impacts

The Calico Solar Project, if constructed and operated as proposed, will use solar energy to generate all of its capacity, consuming no natural gas for power production. The project will decrease reliance on fossil fuel, and will increase reliance on renewable energy resources. The evidence establishes that the project will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. (Ex. 300, p. D.3-1.) Therefore, we find that this project will present no significant adverse impacts on energy resources.

2. Solar Land Use Impacts

The evaluation of solar power plant efficiency includes land use efficiency because of the large expanses of land covered by these facilities. To address land use efficiency, solar efficiency must be determined by evaluating the effectiveness of the specific technology used and the product of three key steps: capture sun's rays, convert energy to heat, and convert heat to electricity. The greater the project's solar efficiency, the less land the plant must occupy to produce a given power output. Therefore, land use efficiency is expressed in terms of power produced, or MW per acre. (Ex. 300, pp. D.3-2, D.3-7..)

The evidence includes a comparison of MWs per acre for the Calico Solar Project and other solar projects currently under review by the Commission. **Efficiency Table 1** provides the power and energy output and the extent of the land occupied for the Calico Solar Project and other solar projects under review. For comparison purposes, the table also includes the solar land use efficiency for a typical fossil fuel-fired (natural gas-fired) combined cycle power plant. (Ex. 300, pp. D.3-2 and D.3-7.)

According to the Staff analysis, the Calico Solar project will produce power at the rate of 850 MW net, and will generate energy at the rate of 1,840,000 MW-hours net per year, while occupying approximately 6,215 acres (Ex. 1. AFC §§ 1.1, 1.3, 2.2, 3.1, 3.11.1.)[1] Staff calculations for the Calico project establish:

Power-based efficiency: 850 MW ÷ 6,125 acres = **0.14 MW/acre** or **7.3 acres/MW**

Staff calculates energy-based land use efficiency thus:

Energy-based efficiency (the first equation removes energy consumed in hydrogen replenishment):

1,840,000 MWh/year -215 MWh/year = 1,839,785 MWh/year

1,839,785 MWh/year ÷ 6,215 acres = **296 MWh/acre-year**

As seen in **Efficiency Table 1** below, the Calico Solar Project, employing the Stirling Energy Systems SunCatcher technology, will be less efficient in use of land than the Beacon Solar, Ridgecrest Solar, Palen Solar, and Blythe Solar projects, which will employ linear parabolic trough technology. Calico Solar is more efficient in use of land than the Ivanpah Solar Electric Generating System project, which will employ BrightSource power tower technology. (Ex. 300, p. D.3-7.)

[1] These results are also representative of the performance of the Scenario 5.5 that is certified in this Decision due to a proportionate reduction in land used and project output. (Ex 317, p. D.3-1.)

Efficiency Table 1 — Solar Land Use Efficiency

Project	Generating Capacity (MW net)	Annual Energy Production (MWh net)	Annual Fuel Consumption (MMBtu LHV)	Footprint (Acres)	Land Use Efficiency (Power-Based) (MW/acre)	Land Use Efficiency (Energy – Based) (MWh/acre-year)	
						Total	Solar Only[1]
Calico Solar (09-AFC-13)	**850**	**1,840,000**	**0**	**6,215**	**0.14**	**296**	**296**
Beacon Solar (08-AFC-2)	250	600,000	36,000	1,240	0.20	484	480
Ivanpah SEGS (07-AFC-5)	400	960,000	432,432	3,744	0.11	256	238
Abengoa Solar (09-AFC-5)	250	630,000	94,280	1,420	0.18	444	434
Blythe Solar (09-AFC-6)	1,000	2,100,000	207,839	5,950	0.17	353	348
Palen Solar (09-AFC-7)	500	1,000,000	103,919	2,970	0.17	337	332
Genesis Solar (09-AFC-8)	250	600,000	60,000	1,800	0.14	333	329
Ridgecrest Solar (09-AFC-9)	250	500,000	51,960	1,440	0.17	347	342
San Joaquin Solar Hybrid (08-AFC-12)	106	774,000	5,899,500	640	0.17	1,209	415
Avenal Energy (08-AFC-1)[2]	600	3,023,388	24,792,786	25	24.0	120,936	N/A

[1]Net energy output is reduced by natural gas-fired combined cycle proxy energy output; see **Efficiency Appendix A**.
[2]Example natural gas-fired combined cycle plant.
Source: Ex. 300, p. D.3-7

Based on the uncontroverted evidence, we make the following findings and reach the following conclusions:

FINDINGS OF FACT

1. The Calico Solar Project will provide approximately 663.5 MW of electrical power and employ Stirling Energy Systems SunCatcher technology, which does not use fossil fuel to generate electricity.

2. The project will use hydrogen gas in the Stirling engines. Hydrogen gas will be produced onsite by electrolysis of water, which will consume 215 MW-hours per year of the electricity generated by the facility.

3. The evidence establishes that the project's fuel consumption will be negligible and therefore no alternative fuel sources were evaluated.

4. The impact of the project's fuel consumption on energy supplies and energy efficiency will be insignificant.

5. The project will decrease reliance on fossil fuel and will increase reliance on renewable energy resources. Consequently, the project will help in reducing California's dependence on fossil fuel-fired power plants.

6. The evidentiary record contains an analysis of the project's land use efficiency and energy output in comparison to other solar projects currently under review by the Commission.

7. The project will occupy approximately 7.3 acres per MW of power output, a figure higher than many other solar power technologies.

8. The Calico Solar Project represents one of the least land use-efficient solar technologies proposed among the projects currently in the Energy Commission's licensing process.

9. No Federal, State, or local laws, ordinances, regulations, or standards apply to the efficiency of this project.

CONCLUSIONS OF LAW

1. The Calico Solar Project will not create adverse effects upon energy supplies or resources, require additional sources of energy supply, or consume energy in a wasteful or inefficient manner.

No Conditions of Certification are required for this topic area.

C. POWER PLANT RELIABILITY

In order to ensure safe and reliable operation of the Calico Solar Project, the Commission must determine whether the project will be appropriately designed and sited. [Pub. Res. Code, § 25520(b); Cal. Code Regs., tit. 20, § 1752(c)(2).] However, there are no LORS that establish either power plant reliability criteria or procedures for attaining reliable operation. (Ex. 300, pp. D.4-1 and D.4-8.)

For the purposes of this section, the Commission considers a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if a project is at least as reliable as other power plants on that system.

The responsibility for maintaining system reliability falls largely to control area operators such as the California Independent System Operator (CAISO) that purchase, dispatch, and sell electric power throughout the State. (Ex. 300, p. D.4-2.) Protocols to ensure sufficient electrical system reliability have been established. For example, “must run” power purchase agreements and “participating generator” agreements are two mechanisms that contribute to an adequate supply of reliable power. (Ex. 300, p. D.4-2.) The California ISO’s mechanisms to ensure adequate power plant reliability are based on the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. (Ex. 300, p. D.4-2.)

The “availability factor” of a power plant is the percentage of time it is available to generate power; both planned and unplanned outages subtract from this availability. Measures of power plant reliability are based upon two factors: (1) the plant’s actual ability to generate power when it is considered to be available and, (2) failures at startup and unplanned (or forced) outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability requires adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. This section examines these factors for the project and compares them to industry norms. (Ex. 300, p. D.4-2.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Applicant proposes to operate the 663.5 megawatt (MW) (net power output) Calico Solar Project, a solar thermal power plant facility employing advanced solar power technology. The Applicant intends to provide dependable power to the grid, generally during the hours of peak power consumption by Southern California Edison (SCE), the interconnecting utility. This project would help serve the need for renewable energy in California, as all its generated electricity will be produced by a reliable source of energy that is available during hot summer afternoons, when power is needed most. In the AFC, the Applicant indicated that it expects the project to achieve an availability factor of 99%. The project is anticipated to operate at an annual capacity factor of approximately 25% (Ex. 1, AFC §§ 1.3, 3.1, 3.9.14, 3.11.1; Ex. 300, p. D.4-3.) However, as discussed below in Plant Maintainability additional information has been provided on this issue. (Ex. 300, p. D.4-4.)

1. Equipment Availability

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction, and operation of the plant and by providing adequate maintenance and repair of the equipment and systems. The project owner will use a QA/QC program typical in the power industry. Equipment will be purchased from qualified suppliers and the project owner will perform receipt inspections, test components, and administer independent testing contracts. To ensure these measures are taken, we have incorporated appropriate Conditions of Certification in the **Facility Design** section of this Decision. (Ex. 300, p. D.4-3.) Applicant's witness testified to the equipment manufacturer's warranty obligations and fulfillment program, which obligates the manufacturer to have sufficient spare parts on hand to maintain a 98 percent availability factor. (8/4/10 RT 167,174.)

2. Plant Maintainability

The Calico Solar Project will operate only when the sun is shining. Redundant pieces of the equipment most likely to require service or repair will be kept on site in order to allow repairs to be made at night when the plant is shut down or during the day, when the plant is in operation. (Ex. 300, p.D.4-3.) The power conversion unit (PCU), which contains the Stirling engine, is the component that has required the most maintenance interventions at the Applicant's Maricopa test facility. The PCU on a SunCatcher will, when in need of maintenance or repair,

simply be changed out and the removed PCU serviced in the shop. Change-out is considered a normal part of plant operation and typically takes as little as 28 minutes. (8/4/10 RT 170.) During change-out, the affected SunCatcher will not generate electricity, but this will not affect the other SunCatchers, which will continue to operate. This modularity is expected to be beneficial to project reliability. (Id.) The project owner will establish a maintenance program based on the equipment manufacturers recommendations. Maintenance outages will likely be planned for periods of low electricity demand. (Ex. 300, p. D.4-4.)

The Applicant predicts that each machine will leak its entire inventory of hydrogen once a year, thus requiring constant replenishment of hydrogen. The Applicant proposes a hydrogen electrolyzer and piping system that uses electricity from the grid to convert water into hydrogen and oxygen, then compresses the hydrogen and pipes it to each of the 26,450 SunCatchers. (Ex. 300, p. D.4-4.) Experience at the Applicant's 1.5 MW Maricopa Plant (a pilot plant using the Stirling Energy Systems SunCatcher units) has shown that Applicant's hydrogen leakage predictions are correct and its replenishment procedure is functioning as expected. (8/4/10 RT 152, 160, 178.)

Staff expressed reluctance to predict the long-term availability factor for the project. (Ex. 300, p. D.4-5.) However, all the evidence points to an ongoing upward trend at the Maricopa facility. (8/4/10 RT 153.) The current 96.1 percent is already within the range of typical power plant availability factors. Although some individuals have expressed concern due to the fact that this will be the first installation of SunCatchers on so large a scale (Exs. 300, p. D.4-1.), these opinions do not take into account the performance of SunCatchers at the Maricopa test facility. There is no evidence in the record that would tend to show that the availability factor will decrease.

The Applicant submitted a confidential report claiming an overall availability factor[1] of 95.1 percent for the Maricopa Plant during the period of March 16 to June 5, 2010. The proposed Calico Solar Project would be a much larger project than the 60-unit Maricopa Plant, but with a similar configuration. The Maricopa Plant has generated 833,738 kWh, representing a capacity factor of 26.7 percent. This represents several hundred hours of plant operation. The applicant claims that it has used, and will continue to use, lessons learned from the Maricopa Plant to incorporate engineering and maintenance improvements into the Calico Solar Project. (8/4/10 RT 180.).

[1] The availability factor of a power plant is the percentage of time it is available to generate power; both planned and unplanned outages subtract from this availability.

The Applicant's revised data from the Maricopa Plant demonstrates an availability factor based on a limited number of operational hours. The long-term availability factor will be determined only with more operational experience of this technology. Staff proposed, and the Applicant has not contested, a condition requiring periodic reports of the reliability and maintenance data from the Maricopa plant, which we adopt as Condition of Certification REL-1, below.

3. Fuel and Water Availability

For any power plant the long-term availability of fuel, and water for cooling or process use, is necessary to ensure reliability. The Calico Solar Project will not use natural gas or other fossil fuel. Therefore, there is no likelihood that availability of natural gas will cause concern. (Ex. 300, p. D.4-4.)

The Calico Solar Project will use water from a groundwater well on private land adjacent to the project site for mirror washing, for potable and fire protection water, and in an electrolysis process to produce hydrogen gas to replenish the hydrogen that leaks from the Stirling engines. (Ex. 1, AFC §§ 1.3, 1.4, 3.1.2, 3.5.6, 3.5.10, 3.7.) At the project site, the water will be pumped from the well, conveyed in an underground pipe to a storage tank, treated and dispersed for onsite use. Since the Stirling engines are air-cooled, no water will be required for power plant cooling. (Ex. 300, p. D.4-4.)

To ensure the well can provide an adequate water supply, we adopt Condition of Certification **Soil & Water-9**, which requires a Water Conservation and Alternative Water Supply Plan, should groundwater monitoring indicate long-term downward trends in water levels and storage. With the implementation of this condition of certification, we find that the water supply will be adequate for the project. For further discussion of water supply, see the **Soil and Water Resources** section of this Decision.

4. Natural Hazards

The site lies within a seismically active region; see the "Faulting and Seismicity" portion of the **Geology and Paleontology** section of this document. The project will be designed and constructed to the latest applicable LORS. (Ex,1, AFC § 3.10.1.1.) Compliance with current seismic design LORS represents an upgrading of performance during seismic shaking compared to older facilities since these LORS have been continually upgraded. Because the solar project will be built to the latest seismic design LORS, this project will likely perform at

least as well as, and perhaps better than, existing plants in the electric power system. We adopted conditions of certification to ensure this; see the **Facility Design** section. The evidence provides no special concerns with the power plant's functional reliability during earthquakes. (Ex. 300, p. D.4-5.)

Portions of the site lie within the 100-year flood plain. (Ex. 1, AFC §§ 3.10.1.4.) Project features will be designed and built to provide adequate levels of flood resistance. Thus, the evidence provides no special concerns with power plant functional reliability due to flooding. For further discussion, see the **Soil and Water Resources** and **Geology and Paleontology** sections. (Ex. 300, p. D.4-5.)

High winds are common in this region of the site; project features will be built to withstand winds over 90 miles per hour. However, at winds greater than 35 miles per hour the SunCatchers will move to a stowed position. (8/4/10 RT 189.) Design would be in accordance with applicable LORS, including the 2007 California Building Code (Ex. 1, AFC § 3.10.1.2). The evidence provides no special concerns with power plant functional reliability due to wind. (Ex. 300, p. D.4-5.)

5. Comparison to Industry Norms

The North American Electric Reliability Corporation (NERC) maintains industry statistics for availability factors (as well as other related reliability data). The NERC regularly polls North American utility companies on their project reliability through its Generating Availability Data System and periodically summarizes and publishes those statistics on the Internet at <http://www.nerc.com>. Energy Commission staff typically compares the applicant's claims for reliability to the statistical reliability of similar power plants. Because solar technology is relatively new and the technologies employed so varied, no NERC statistics are available for solar power plants. Thus our typical comparison with other existing facilities cannot be accomplished. (Ex. 300, p. D.4-5.)

Nevertheless, typical availability factors for gas-fired power plants range from 94 to 98 percent. *See* North American Electric Reliability Council *2005–2009 Generating Availability Report,* available at <www.nerc.com/elibrary>. Given that the evidence of limited performance history shows the Calico project will likely achieve an availability factor within this range, we find that the project compares favorably with industry norms for utility-scale electrical generation facilities.

FINDINGS OF FACT

Based on the uncontested evidence, we make the following findings:

1. No federal, state, or local/county LORS apply to the reliability of the Calico Solar Project.

2. A project's reliability is acceptable if it does not degrade the reliability of the utility system to which it is connected.

3. No NERC statistics for solar power plants are currently available. Therefore, the evidence contains a comparison of the project's predicted availability factor to the average availability factor of fossil-fueled plants.

4. The technology used by the Calico Solar Project has certain potential reliability advantages compared to other generating technologies including its modularity and the ability to maintain and repair individual units without materially affecting overall output, and certain disadvantages including a relative lack of historical field data on commercial-scale installations.

5. The Calico Solar Project is anticipated to operate at an annual capacity factor of approximately 25

6. Implementation of QA/QC programs during design, procurement, construction, and operation of the plant, as well as adequate maintenance and repair of the equipment and systems, will ensure the project is adequately reliable.

7. Appropriate Conditions of Certification included in the **FACILITY DESIGN** portion of this Decision ensure implementation of the QA/QC programs and conformance with seismic design criteria.

8. The Applicant will use the water from a private well adjacent to the project site to supply water for the project. The evidence includes additional information regarding the Lavic Groundwater Basin, and with the implementation of Condition of Certification SOIL&WATER-9, the water supply will be adequate for the project.

9. The project will meet or exceed reliability during seismic events, flooding and high winds.

10. The project will incorporate an appropriate redundancy of function for its equipment.

11. The project will provide renewable energy on hot summer days, when it is most needed.

CONCLUSIONS OF LAW

1. We therefore conclude that the Calico Solar Project will meet or exceed industry norms and not degrade the overall reliability of the electrical system.

2. There are no LORS that establish either power plant reliability criteria or procedures for attaining reliable operation.

CONDITIONS OF CERTIFICATION

REL-1 From the time of the Energy Commission's adoption of this condition of certification to the start of commercial operation of the Calico Solar Project, or to the closure of the Maricopa Plant, whichever occurs earlier, the project owner shall obtain and provide to the CPM quarterly data sets of reliability and maintenance data from the Maricopa Plant, including the following:

a) logs of equipment failure data and operational data for all major equipment, including power conversion units, drive mechanisms, and controls. These logs shall include major equipment and plant availability factors, and major equipment and plant forced outage rates, including their causes and durations

b) plant operating logs showing dates and times of dispatch, and power level of dispatch

During the first two years of the commercial operation of the Calico Solar Project, the project owner shall maintain quarterly data sets of reliability and maintenance data, including the information specified in paragraphs a) and b) above, for the Calico Solar Project and make the information available to the CPM upon request.

Verification: On a quarterly basis, the project owner shall submit the Maricopa project data described in paragraphs a) and b) above, to the CPM, and shall make the Calico Solar Project data available to the CPM upon request.

D. TRANSMISSION SYSTEM ENGINEERING

The transmission system engineering analysis examines whether the Calico Solar Project's proposed interconnection conforms to all laws, ordinances, regulations, and standards (LORS) required for safe and reliable electric power transmission. The Commission's jurisdiction includes "…any electric power line carrying electric power from a thermal power plant… to a point of junction with an interconnected transmission system." (Pub. Res. Code § 25107.) Additionally, under CEQA, the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (Title 14, California Code of Regulations Section 15378). The Energy Commission must, therefore, identify the system impacts and necessary new or modified transmission facilities downstream of the proposed interconnection that are required for interconnection and that, when included with the other project features, represent the whole of the action. (Ex. 300, p. D.5-1.)

Commission staff relies on the responsible interconnecting authority for analysis of impacts on the transmission grid, as well as for the identification and approval of new or modified facilities required downstream from a proposed interconnection for mitigation purposes. The proposed Calico Solar Project will connect to Southern California Edison's (SCE's) existing 230 kV transmission network and will require both analysis by SCE and the approval of the California Independent System Operator (CAISO). (Ex. 300, p. D.5-1.)

The CAISO is responsible for ensuring electric system reliability for all participating transmission owners and for developing the standards to achieve system reliability. The power generated by the proposed Calico Solar Project will be dispatched to the CAISO grid via SCE's existing Pisgah 230 kV Substation. Therefore, the CAISO will review the studies of the SCE system to ensure adequacy of the proposed transmission interconnection. The California ISO determines the reliability impacts of proposed transmission modifications on the SCE transmission system in accordance with all applicable reliability criteria. According to the California ISO tariffs, the California ISO will determine the need for transmission additions or upgrades downstream from the interconnection point to insure reliability of the transmission grid. (Ex. 300, p. D.5-2.)

The CAISO reviewed the System Impact Study prepared by SCE for the proposed project and issued a preliminary approval to SCE. On completion of the SCE Facility Study, the CAISO will review the study results and provide its conclusions and recommendations. (Ex. 300, p. D.5-2.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Transmission Facilities Description

The applicant proposes to interconnect the proposed 663.5 megawatt (MW) Calico Solar Project to SCE's existing Pisgah 230 kV Substation, which is located in San Bernardino County approximately 35 miles east of Barstow, California. The proposed project will be developed in two phases, one 275 MW phase (Calico Solar Project Phase 1), and one 388.5 MW phase (Calico Solar Project Phase 2). (Ex. 300, p. D.5-4.)

The Calico Solar Project is a solar concentrating thermal power plant, based on the proprietary SunCatcher technology of Sterling Energy System, Inc. Each SunCatcher consists of a 25-kilowatt (kW) solar power generating system. The project will consist of approximately 34,000 SunCatchers total for the two phases. Each complete solar group will consist of 60 SunCatchers, which correlates to a 1.5 MW power block with a corresponding GSU (collector group step-up unit) transformer. The 1.5 MW solar groups will be connected by underground electrical cables to create the 3, 6, and 9 MW solar groups. MW groups will be coupled through underground electrical cables and will ascend through a pole riser to either a 48 MW or 51 MW overhead distribution collector line. The overhead collector groups will deliver the solar electric generated power to a new 850 MW substation constructed on site as part of the project. (Ex. 1, Section 3.4, pages 3-27 to 3-32 and Figure 3-1 to 3-45, Ex. 300, p. D.5-4.)

The substation will consist of six open-air bus segments with each segment consisting of five 1,200A, 35 kV collection feeder circuit breakers. One 48 MW and two 51 MW overhead collection lines will be connected to each of the six 34.5 kV bus segments via circuit breakers. Additionally, two 35 kV circuit breakers in each segment will connect to capacitor banks in the substation yard. For Phase 1 of the project, the first interconnection substation will consist of six power transformers rated at 100/133/167 MVA each to convert the generation collection voltage from 34.5 kV to the transmission tie voltage of 230kV. Each power transformer will serve 3 of the 15 overhead collection lines. The high side of each step up transformer will be connected to the 230kV bus segments via 2000A, 230kV circuit breakers. One common bus for each phase will be formed by connecting the 230 kV bus segments through 2000A disconnect switches. (Ex. 300, pp. D.5-4 to D.5-5.)

An approximately two-mile long 230-kV single circuit will be used to interconnect the new Calico Solar Project substation to the existing Pisgah Substation. Each circuit of the overhead line begins at a dead-end structure in the Calico Solar Project substation, continues east and parallel to the Burlington Northern Santa Fe (BNSF) railroad ROW, and south crossing the BNSF railroad to a point where the line turns east leaving the site and undercrossing three SCE transmission lines before it finally enters the SCE Pisgah substation from the south. The transmission lines will start within the project site boundary but a 0.14 mile long segment from the project site to the Pisgah Substation will be outside the project site boundary. The off-site portion of the 230kV interconnect transmission line will be routed under existing SCE transmission lines. Construction of that line will include dead-end structures in the substation and 12 to 15 230 kV lattice steel towers and/or tubular steel poles and new 1,590 kcmil ACSR conductors for each phase of the circuit. (Ex. 300, p. D.5-5.)

Furthermore, SCE has proposed expanding and upgrading the existing 230kV SCE Pisgah substation to a 230/500kV substation, increasing the voltage to 500kV, looping the Eldorado-Lugo 500kV line into the SCE Pisgah substation and upgrading 65 miles of the existing Lugo-Pisgah number two 230kV transmission line to 500kV. (Ex. 300, p. D.5-5.)

Pre-Project Upgrade Requirements. The upgrades included below are those facilities that are required to mitigate reliability violations caused by higher-queued projects, placed ahead of the project in the generator interconnection queue, and are expected to be implemented by those higher-queued projects. In the event that any of these higher-queued projects withdraw their application, the Calico Solar Project may become responsible for these additional facilities.

- Upgrade of the Inyo 115kV Phase-Shift transformer;
- Inyokern substation conversion to 230kV;
- New Lugo-Kramer Transmission Line project;
- Construction of a third Lugo 500/230kV transformer Bank;
- Mountain Pass-El Dorado 115kV line reconductor;
- Replacing El Dorado 230/115kV transformer Bank with a larger size. (Ex. 300, p.D.5-7.)

2. Transmission System Impacts Analysis

SCE prepared the System Impact Studies (SIS) at the request of the Applicant to identify the potential impacts of the proposed Calico Solar Project on SCE's

transmission system. The SIS included power flow, sensitivity, and short circuit studies, and transient and post-transient analyses. The SIS modeled the proposed project for a net output of 850 MW. The base cases included all CAISO approved major SCE transmission projects, and major path flow limits of Southern California Import Transmission (SCIT), East-Of-River, West-of-River and upgraded 115kV phase shifting transformer at Inyo substation. The SIS considered light load conditions with generation patterns and SCIT imports maximized to identify the extent of potential congestion and to fully stress the SCE system in the area where the project phases of the proposed Calico Solar Project will be interconnected. (Ex. 300, pp. D.5-5 to D.5-6.)

The power flow studies were conducted with and without Calico Solar connected to SCE's grid at the existing Pisgah Substation, using 2009 heavy summer and 2009 light spring base cases. The power flow study assessed the potential impacts of the proposed Calico Solar Project on thermal loading of the transmission lines and equipment. Transient and post-transient studies were conducted for Phases 1 and 2 of the proposed Calico Solar Project using the 2009 heavy summer base case to determine whether the project will create instability in the system following certain selected outages. Short circuit studies were conducted to determine if Phases 1 and 2 of the proposed Calico Solar Project will overstress existing substation facilities. (Ex. 300, pp. D.5-5 to D.5-6.)

Based on the results of the SIS and the implementation of **Conditions of Certification TSE-1 through TSE-7**, we find that the outlet lines and termination of Phases 1 and 2 of the proposed Calico Solar Project are acceptable and will comply with all applicable LORS. This determination is based on Commission staff evaluation of the project transmission lines and equipment, both from the power plant up to the point of interconnection with the existing transmission network as well as upgrades beyond that interconnection that are attributable to the project. (Ex. 300, p.D.5-23.) In addition, the staff analysis included recommended measures (required facilities) that must be met by the project owner as part of the project. These required facilities include:

- Expand the existing Pisgah 230kV interconnection facility;
- Loop the existing Eldorado-Lugo 500kV transmission line into the expanded Pisgah substation;
- Install a new Lugo-Pisgah Number 2 500kV transmission line;
- Require a Special Protection System (SPS) to mitigate thermal overloads;
- Design and construct the project with adequate reactive power resources. (Ex. 300, pp.D.5-1 and D.5-23.)

3. Cumulative Impacts

The cumulative analysis considers whether the interconnection of the Calico Solar Project to SCE's transmission system along with other existing and foreseeable generation projects will conform to all LORS. The geographic scope for cumulative impacts on the electric system includes the Southern California Edison (SCE) grid. The SCE grid includes many natural gas-fired power plants, several hydroelectric power plants, and a growing number of solar and wind power plants. The existing transmission system in the project area lacks additional capacity and will require upgrades for any projects not currently interconnected to the grid. (Ex. 300, p. D.5-16.)

The impacts identified in the SIS will be mitigated with the identified recommended measures and conditions of certification, which will minimize the project's contribution to cumulative impacts. The evidence also supports positive impacts because the Calico Solar Project will supplement local solar generation and import of power to the SCE system, and will meet the increasing load demand in the San Bernardino County and Riverside County. (Ex. 300, p. D.5-16.)

4. Public and Agency Comments

No public or agency comments were received for transmission system engineering.

FINDINGS OF FACT

Based on the uncontroverted evidence of record, the Commission makes the following finding:

1. The proposed interconnection of the 663.5 MW Calico Solar Project to SCE's existing Pisgah 230 kV substation, the new 230 kV Calico substation, two-mile long transmission line, GSU transformer, and other associated facilities will be in accordance with NERC/WECC planning standards and CAISO reliability criteria. We find that with implementation of the required facilities and the conditions of certification, the requirements and standards of all applicable engineering LORS contained in **Appendix A** will be met.

2. The record includes a System Impact Study, which analyzed potential reliability and congestion impacts that could occur when the Calico Solar Project interconnects to the grid.

3. The System Impact Study considered power flow with implementation of pre-project upgrades that will be made by projects in a higher-queue than the Calico Solar Project and also considered power flow with pre-project and project-initiated upgrades.

4. The System Impact Study performed by SCE demonstrates that the addition of the Calico Solar Project will cause new normal (N-0) and single contingency (N-1) overloads on the Lugo No. 1 & No. 2 500/230 kV transformer banks and the Lugo-Pisgah 230 kV lines during heavy summer peak and light spring conditions. However, with all pre-project upgrades and project-related upgrades, the base overloads were eliminated.

5. The System Impact Study also evaluated transient and post transient scenarios. The study determined the system remained stable with the implementation of pre-project and proposed project-related system upgrades.

6. The record contains analysis of required facilities the Applicant will need to implement to mitigate project-related thermal overloads.

7. The Calico Solar Project will meet the requirements and standards of all applicable LORS upon compliance with the recommended Conditions of Certification.

8. The Calico Solar Project is a solar generation facility, which will provide clean renewable energy that will help meet state mandates and goals.

CONCLUSIONS OF LAW

1. With the implementation of the conditions of certification specified in this Decision, and the conditions of certification which follow, the proposed transmission interconnection for the Calico Solar Project will not contribute to significant adverse direct, indirect, or cumulative impacts.

2. The conditions of certification identified below ensure that the transmission-related aspects of the Calico Solar project will be designed, constructed, and operated in conformance with the applicable laws, ordinances, regulations, and standards identified in the appropriate portion of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall furnish to the Compliance Project Manager (CPM) and to the Chief Building Official (CBO) a schedule of transmission facility design submittals, a Master Drawing List, a Master

Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days prior to the start of construction (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Transmission System Engineering Table 1**, Major Equipment List below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Transmission System Engineering Table 1
Major Equipment List

Breakers	Take Off Facilities
Step-Up Transformer	Electrical Control Building
Switchyard	Switchyard Control Building
Busses	Transmission Pole/Tower
Surge Arrestors	Grounding System
Disconnects	

TSE-2 Prior to the start of construction, the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq. require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California-registered electrical engineer. The civil, geotechnical or civil, and design engineer assigned in

conformance with Facility Design Condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval.

The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days prior to the start of rough grading (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner shall have five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of that approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has previously undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action, (California Building Code, 1998, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required obtaining the CBO's approval**.**

TSE-4 For the power plant switchyard, outlet line, and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

Receipt or delay of major electrical equipment;

Testing or energization of major electrical equipment; and

The number of electrical drawings approved, submitted for approval, and still to be submitted**.**

Verification: At least 30 days prior to the start of each increment of construction (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit to the CBO for review and approval the final design plans, specifications, and calculations for equipment and systems of the power plant switchyard, outlet line, and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and shall include a copy of the transmittal letter in the next Monthly Compliance Report**.**

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities conform to all applicable LORS, including the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

1. The Calico Solar Project shall be interconnected to the SCE grid via a segment of 230kV, 1590 kcmil-ACSR, approximately 2 mile long single circuit extending from the new substation on the project site to the Pisgah SCE Substation.

2. The Calico Solar Project substation on the project site shall use 34.5kV, 1200A, 25 breakers and six, three phase, 100/133/167.7 MVA, 34.5kV/230 kV transformers.

3. The power plant outlet line shall meet or exceed the electrical, mechanical, civil, and structural requirements of CPUC General Order 95 and General Order 98 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8),

Articles 35, 36, and 37 of the "High Voltage Electric Safety Orders", California ISO standards, National Electric Code (NEC), and related industry standards.

4. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

5. Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with that owner's standards.

6. The project conductors shall be sized to accommodate the full output from the project.

7. Termination facilities shall comply with applicable SCE interconnection standards.

8. The generating facility shall provide sufficient reactive power resources on the project site as specified by the power factor design criteria requirements in Large Generator Interconnection Agreement.

Verification: At least 30 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agreed to by the project owner and CBO), the project owner shall submit to the CBO for approval:

1. Design drawings, specifications, and calculations conforming with CPUC General Order 95 and General Order 98 or NESC; Title 8, California Code of Regulations, Articles 35, 36, and 37 of the "High Voltage Electric Safety Orders"; NEC; applicable interconnection standards, and related industry standards for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment.
2. For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on worst-case conditions,[1] and a statement signed and sealed by the registered engineer in responsible charge**,** or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC; Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; NEC; applicable interconnection standards, and related industry standards.
3. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering

[1] Worst-case conditions for the foundations would include for instance, a dead-end or angle pole.

description of equipment and the configurations covered by requirements **TSE-1 through 5** above.

TSE-6 The project owner shall provide the following Notice to the California Independent System Operator (California ISO) prior to synchronizing the facility with the California transmission system:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the California ISO a letter stating the proposed date of synchronization; and

2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the California ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the California ISO letter to the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. A report of the conversation with the California ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

TSE-7 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC; Title 8, CCR, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; applicable interconnection standards; NEC; and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

1. As-built engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC; Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders"; applicable interconnection standards; NEC; and related industry standards, and these conditions shall be provided concurrently with the submittal of the as-built plans.

2. An as-built engineering description of the mechanical, structural, and civil portions of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. As-built drawings of the electrical, mechanical, structural, and civil portions of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan."

3. A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

E. TRANSMISSION LINE SAFETY AND NUISANCE

The Calico Solar, LLC, project's transmission line must be constructed and operated in a manner that protects environmental quality, assures public health and safety, and complies with applicable law. This portion of the Decision assesses the potential for the generation tie line to create the various impacts mentioned below, as well as to determine whether mitigation measures are required to reduce any significant adverse effects to insignificant levels. The analysis of record takes into account both the physical presence of the line and the physical interactions of its electric and magnetic fields. Evidence was submitted by Applicant, Staff, and Intervenor BNSF. (8/25/2010 RT 8, 318-319; Exs. 1; 300, C.12; 1200-1210.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The proposed tie-in line system for the two project phases would consist of the following individual segments:

- A new, single-circuit 230-kV overhead transmission line extending two miles from the on-site project switchyard to SCE's Pisgah Substation; and
- The project's on-site 230-kV switchyard from which the conductors would extend to the SCE Pisgah Substation.

The on-site segment of the proposed project line would be located within its own unshared right-of-way as it extends from the on-site substation, crossing over three SCE transmission lines of 230-kV and 500-kV as it extends to the connection point within the Pisgah Substation. The proposed routing scheme was chosen to minimize the length of the required line and to locate the line within existing line corridors to the extent possible. To accommodate the power from Phase 1 and later Phase 2, SCE has proposed expanding and upgrading the 230-kV Pisgah Substation to 500-kV, looping the Eldorado-Lugo 500-kV line into the Pisgah Substation and upgrading 65 miles of the existing Lugo-Pisgah No.2 230 line to 500-kV. Modifications within SCE's El Dorado and Lugo Substations would also be necessary. These project-related line modifications would be under CPUC and BLM jurisdiction and would thus be made according to CPUC guidelines ensuring compliance with existing health and safety LORS. (Exs. 1, pp. 3-27 to 3-36; 300, pp. C.12-1, C.12-4.)

Potential impacts involve aircraft collisions, interference with radio frequency communication, audible noise, fire danger, hazardous shocks, nuisance shocks,

and electric and magnetic field (EMF) exposure. (Ex. 300, pp. C.12-5 to C.12-8.) The evidence conclusively establishes the following:

1. Aviation Safety

Any potential hazard to area aircraft would relate to the potential for collision in the navigable airspace. The LORS listed in the Supplemental Staff Assessment, **TLSN Table 1** (Ex. 300, p.C.12-2), require FAA notification in cases of structures over 200 feet from the ground, or if the structure is less than 200 feet in height but would be located within the restricted airspace in the approaches to public or military airports. For airports with runways longer than 3,200 feet, the restricted space is defined by the FAA as an area extending 20,000 feet from the runway. For airports with runways of 3,200 feet or less, the restricted airspace would be an area that extends 10,000 feet from this runway. For heliports, the restricted space is an area that extends 5,000 feet.

The closest area airports are too far from the proposed project and related facilities to pose a collision hazard to aircraft according to FAA criteria. Furthermore, the maximum height of 110 feet for the proposed line support structures would be much less than the 200-foot height that triggers the concern over aviation hazard according to FAA requirements. (Exs. 1; p. 3-31 and Figure 3.4-39; 300, p. C.12-5.)

2. Interference with Radio-Frequency Communication

This potential impact is one of the indirect effects of line operation and is produced by the physical interactions of the electric fields. It arises from corona discharge and is primarily a concern for lines larger than 345-kV. When generated, it is perceived as interference with radio or television signal reception or interference with other forms of radio communication. The project's 230-kV line will be built and maintained according to standard SCE practices aimed at minimizing any interference. Moreover, there are no nearby residential receptors. Thus, no radio frequency interference or related complaints are likely. (Ex. 300, pp. C.12-5 to C.12-6.)

3. Audible Noise

This is typically perceived as a characteristic crackling, hissing, or frying sound or hum, especially in wet weather.[1] The noise level depends upon the strength of the line's electric field, and is a concern mainly from lines of 345-kV or higher. It can be limited through design, construction, and maintenance practices. The project's line (230-kV) will embody a low corona design to minimize field strengths. The evidence shows that the line is not expected to add significantly to the current background noise levels.[2] (Ex. 300, p. C.12-6.)

4. Fire Hazards

Fire can be caused by sparks from the line's conductors or by direct contact between the line and nearby trees or other combustible objects. SCE's standard fire prevention and suppression measures, and compliance with the clearance-related aspects of GO-95 as required in Condition of Certification **TLSN-3**, ensure that appropriate fire prevention measures are implemented. (Ex. 300, pp. C.12-6.)

5. Hazardous Shocks

These could result from direct or indirect contact between an individual and the energized line. Adherence to minimum national safe operating clearances in areas where the line might be accessible to the public assures safety. Compliance with the CPUC's GO-95, as required in Condition of Certification **TLSN-1**, will ensure that adequate measures are implemented to minimize this potential impact. (Ex. 300, p. C.12-6.)

6. Nuisance Shocks

Nuisance shocks are typically caused by direct contact with metal objects electrically charged by fields from an energized line. They are effectively minimized through grounding procedures for all metallic objects within the right-of-way as specified by the National Electrical Safety Code (NESC) as well as the joint guidelines of the American National Standards Institute (ANSI) and the

[1] In fair weather, audible noise from modern transmission lines is generally indistinguishable from background noise at the edge of a right-of-way 100 or more feet wide. (Ex. 300, p. C.12-6.)

[2] Overall project noise levels are discussed in the **Noise** section of this Decision.

Institute of Electrical and Electronics Engineers (IEEE). This is required in Condition of Certification **TLSN-4**. (*Id.*)

The railway line of Intervenor Burlington Northern Santa Fe (BNSF) bisects the project site. To avoid the risk of inductive shocks related to the Calico transmission lines, BNSF requested that Condition of Certification **TLSN-4** be modified to require a minimum clearance of 300 feet between the proposed transmission lines and the edge of the right-of-way for the BNSF tracks. In addition, in the location where the transmission line is proposed to cross the tracks, BNSF argues that the transmission line should do so at a 90-degree angle, and should travel 300 feet from the far side of the right of way before returning to a parallel configuration. Applicant and Staff supported BNSF's proposed change. We have modified Condition of Certification **TLSN-4** and added a new **TLSN-5** to incorporate the BNSF requests. (Exs. 300, pp. C.12-6 and C.12-8; 1200; 1209; 8/25/10 RT pp. 8, 318, 319.)

7. Exposure to Electric and Magnetic Fields

Electric and magnetic fields (EMF) occur whenever electricity flows. The possibility of deleterious health effects from exposure to EMF has raised public health concerns about living and working near high-voltage lines. Due to the present scientific uncertainty regarding these potential health effects, CPUC policy requires reduction of EMF fields in the design, construction, and maintenance of new or modified lines, if feasible, without affecting the safety, efficiency, reliability, and maintainability of the transmission grid. (Ex. 300, pp. C.12-7 to C.12-8.)

The CPUC requires each new or modified transmission line in California to be designed according to the EMF-reducing guidelines of the electric utility in the service area involved. EMF fields produced by new lines must be similar to the fields of comparable lines in that service area. To comply with CPUC requirements for EMF management, SCE's specific field strength-reducing measures will be incorporated into the project line's design and include:

- Increasing the distance between the conductors and the ground to an optimal level;
- Reducing the spacing between the conductors to an optimal level;
- Minimizing the current in the line; and
- Arranging current flow to maximize the cancellation effects from the interaction of conductor fields. (Ex. 300, pp. C.12-9 to C.12-10.)

Applicant calculated the maximum electric and magnetic field intensities expected along the Phase I line route.[3] Condition of Certification **TLSN-2** requires that actual field strengths be measured, according to accepted procedures, to insure that the field intensities are similar to those of other SC&E lines. These measurements will reflect both the effectiveness of the field reduction techniques used and the project's potential contribution to area EMF levels. (Ex. 300, p. C.12-10.)

Since there are no residences in the vicinity of the project's line, there will not be the long-term human residential EMF exposures primarily responsible for the health concern of recent years. The only project-related EMF exposures of potential significance are the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in the immediate vicinity of the lines. The evidence shows that these types of exposures are not significantly related to an adverse health effect. (Ex. 300, p. C.12-16, C.12-19.)

Overall, the evidence shows that the tie line will be designed, constructed, operated, and maintained in compliance with applicable LORS. Implementation of the Conditions of Certification will ensure that any impacts are reduced to less than significant levels. (Ex. 300, pp. C.12-16 to C.12-17.)

Finally, the evidence addresses the impacts of a 275 MW Reduced Acreage Alternative and various No Project Alternatives in regard to this topic area. The Calico Solar Project does not create significant adverse impacts in this topic area. Therefore, it is not necessary to consider any of the project's alternatives as a means of reducing impacts to below a level of significance. (Ex. 300, pp. C.11-10 to C.12-13.)

FINDINGS OF FACT

Based on the evidence, we make the following findings:

1. The Calico Solar, LLC, transmission facilities consist of an on-site 230-kV switchyard and a two-mile long, 230-kV single-circuit overhead transmission tie line extending from the switchyard to SCE's Pisgah Substation.

[3] Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m) for the electric field and milligauss (mG) for the companion magnetic field. The maximum electric field strength (0.2 kV/m) and the maximum magnetic field intensity (20 mG) calculated at the edge of the right-of-way are similar to those of other SCE 230-kV lines. (Ex. 300, p. C.12-9.)

2. The evidentiary record includes analyses of potential impacts from the project's generation tie line involving aircraft collisions, interference with radio frequency communication, audible noise, hazardous shocks, nuisance shocks, fire danger, and EMF exposure.

3. Specific measures have been adopted to minimize the risk of inductive shocks along the railroad right-of-way adjacent to the project.

4. There are no residences along the route of the project's new generation tie line.

5. The available scientific evidence does not establish that EMF fields pose a significant health hazard to humans.

6. The electric and magnetic fields generated by the project's generation tie line will be managed to the extent the CPUC considers appropriate, based on available health effects information.

7. The project's generation tie line will comply with existing LORS for public health and safety.

8. The project's generation tie line will incorporate standard EMF-reducing measures established by the CPUC and used by SCE.

9. The project owner will provide field intensity measurements before and after line energization to assess EMF contributions from the project-related current flow.

10. The new generation tie line will not result in significant adverse environmental impacts to public health and safety or cause significant direct, indirect, or cumulative impacts as a result of aviation collisions, radio frequency communication interference, fire danger, nuisance or hazardous shocks, or electric and magnetic field exposure.

11. The record addresses the impacts of a reduced acreage and various No Project Alternatives in regard to this topic area.

12. Implementation of any of the Alternatives mentioned above is not necessary or preferable as a means of reducing project related impacts to below a level of significance.

CONCLUSIONS OF LAW

1. Implementation of the Conditions of Certification, below, will ensure that the Calico Solar, LLC project's line complies with all applicable laws, ordinances, regulations, and standards relating to **Transmission Line Safety and Nuisance** as identified in the pertinent portion of **Appendix A** of this Decision.

2. The Calico Solar, LLC project's transmission line will not create a significant impact due to tie line safety and nuisance factors.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed transmission line (anywhere along the area identified by the Applicant as available for its routing) according to the requirements of California Public Utility Commission's GO-95, GO-52, GO-131-D, Title 8, and Group 2, High Voltage Electrical Safety Orders, sections 2700 through 2974 of the California Code of Regulations, and Southern California Edison's EMF reduction guidelines.

Verification: At least 30 days before starting the transmission line or related structures and facilities, the project owner shall submit to the Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the Condition.

TLSN-2 The project owner shall use a qualified individual to measure the strengths of the electric and magnetic fields from the line at the points of maximum intensity along the route for which the Applicant provided specific estimates. The measurements shall be made before and after energization according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures. These measurements shall be completed no later than 6 months after the start of operations.

Verification: The project owner shall file copies of the pre-and post-energization measurements with the CPM within 60 days after completion of the measurements.

TLSN-3 The project owner shall ensure that the rights-of-way of the proposed transmission line are kept free of combustible material, as required under the provisions of section 4292 of the Public Resources Code and section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities

carried out along the right-of-way and provide such summaries in the Annual Compliance Report on transmission line safety and nuisance-related requirements.

TLSN-4 The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded according to industry standards regardless of ownership. A minimum clearance of 300 feet shall be maintained between the proposed transmission line and the edge of the right-of-way for BNSF Railroad Company's railroad tracks.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

TLSN-5 Project owner's transmission lines shall make any crossing of the BNSF mainline at a 90-degree angle.

Verification: At least 30 days before the lines are energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

V. PUBLIC HEALTH AND SAFETY

A. GREENHOUSE GAS (GHG) EMISSIONS

INTRODUCTION AND SUMMARY

There is wide scientific consensus that climate change is occurring and that human activity contribute to that change. Man-made emissions of greenhouse gases, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Indeed, the California Legislature has found that "[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California" (Cal. Health & Safety Code, sec. 38500, division 25.5, part 1). (Ex. 300, p. C.1-64.)

The California Air Resources Board (ARB) has promulgated regulations for mandatory GHG emission reporting to comply with the California Global Warming Solutions Act of 2006 (AB 32 Núñez, Statutes of 2006, Chapter 488, Health and Safety Code sections 38500 et seq.) (ARB 2008a). The Calico Solar Project, which will solely generate electricity from solar power, is exempt from the mandatory GHG emission reporting requirements for electricity generating facilities [CCR Title 17 §95101(c)(1)]. However, the project may be subject to future reporting requirements and GHG reductions or trading requirements as these regulations become more fully developed and implemented. (Ex. 300, p. C.1-63.)

The evidence includes consideration of SB 1368, which addresses the Greenhouse Gas Emission Performance Standard. The Calico Solar Project, as a renewable energy generation facility, is determined by rule to comply with the requirements of SB 1368 (Chapter 11, Greenhouse Gases Emission Performance Standard, Article 1, Section 2903 [b][1]). (Ex. 300, pp. C.1-62 and C.1-68.)

The generation of electricity using fossil fuels, even in a back-up generator at a thermal solar plant, produces air emissions known as greenhouse gases in addition to the criteria air pollutants that have been traditionally regulated under the federal and state Clean Air Acts. California is actively pursuing policies to reduce GHG emissions that include adding non-GHG emitting renewable generation resources to the system. (Ex. 300, pp. C.1-66 to C.1-67.)

The greenhouse gases are carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFC), and perflurocarbons (PFC). CO_2 emissions are far and away the most common of these emissions; as a result, even though the other GHGs have a greater impact on climate change on a per-unit basis, GHG emissions are often expressed in terms of "metric tons of CO_2-equivalent" ($MTCO_2e$) for simplicity. (Ex. 300, p. C.1-63.)

The state has demonstrated a clear willingness to address global climate change through research, adaptation, and inventory reductions. In that context, this part of the Decision evaluates the GHG emissions from the proposed project, presents information on GHG emissions related to electricity generation, and describes the applicable GHG standards and requirements. (*Id.*)

1. Policy and Regulatory Framework

The Legislature stated 35 years ago, "it is the responsibility of state government to ensure that a reliable supply of electrical energy is maintained at a level consistent with the need for such energy for protection of public health and safety, for promotion of the general welfare, and for environmental quality protection." (Pub. Res. Code, § 25001.) Today, as a result of compelling science showing a clear link between greenhouse gas emissions and negative environmental impacts, the most recent addition to "environmental quality protection" is the reduction of GHG emissions. Several laws and statements of policy are applicable.

a. <u>AB 32</u>

The foundation of California's GHG policy is the California Global Warming Solutions Act of 2006. [Assembly Bill 32, codified in Health & Saf. Code, § 38560 et seq. (hereinafter AB 32).] AB 32 requires the California Air Resources Board ("CARB") to adopt regulations that will reduce statewide GHG emissions, by the year 2020, to the level of statewide GHG emissions that existed in 1990. Gubernatorial Executive Order S-3-05 (June 1, 2005) requires a further reduction, to a level 80 percent below the 1990 GHG emissions, by the year 2050.

Along with all other regulatory agencies in California, the Energy Commission recognizes that meeting the AB 32 goals is vital to the state's economic and environmental health. The scoping plan adopted by ARB relies heavily on cost-effective energy efficiency and demand response, renewable energy, and

prioritization of generation resources to achieve significant reductions of emissions in the electricity sector by 2020. Even more dramatic reductions in electricity sector emissions would likely be required to meet California's 2050 greenhouse gas reduction goal. Facilities under our jurisdiction, such as Calico Solar Project, must be consistent with these policies.[1]

b. Renewable Portfolio Standard

California statutory law requires the state's utilities to be obtaining at least 20 percent of their electricity supplies from renewable sources by the year 2020. (Pub. Util. Code, § 399.11 et seq.) Gubernatorial Executive Orders increase the requirement to 33 percent and require CARB to adopt regulations to achieve the goal. [Governor's Exec. Orders Nos. S-21-09 (Sept. 15, 2009), S-14-08 (Nov. 17, 2008).]

c. Emissions Performance Standard

Senate Bill (SB) 1368 of 2006, and regulations adopted by the Energy Commission and the Public Utilities Commission pursuant to the bill, prohibit utilities from entering into long-term commitments with any base load facilities that exceed an Emission Performance Standard (EPS) of 0.500 metric tonnes of CO_2 per megawatt-hour (this is the equivalent of 1100 pounds CO_2/MWh). (Pub. Util. Code, § 8340 et seq.; Cal. Code Regs., tit. 20, § 2900 et seq.; CPUC D0701039.) Currently, the EPS is the only LORS that has the effect of limiting power plant GHG emissions. As noted earlier, Calico Solar must comply with this requirement.

d. Loading Order

In 2003, the Energy Commission and the CPUC agreed on a "loading order" for meeting electricity needs. The first energy resources that should be utilized are energy efficiency and demand response (at the maximum level that is feasible and cost-effective), followed by renewables and distributed generation, combined heat and power (also known as cogeneration), and finally the most efficient

[1] Of course, the Calico Solar Project and all other stationary sources will need to comply with any applicable GHG LORS that take effect in the future.

available fossil fuel resources and infrastructure development.[2] CARB's AB 32 Scoping Plan reflects these policy preferences. (California Air Resources Board, Climate Change Scoping Plan, December 2008.)

3. GHG Emissions During Construction of the Facility

Construction of industrial facilities such as power plants requires coordination of numerous equipment and personnel. The concentrated on-site activities result in short-term, unavoidable increases in vehicle and equipment emissions that include greenhouse gases. Construction of the proposed project has two phases. There will be approximately 12 month-overlapping period between each phase, which would result in four years of continuous construction. The Applicant provided a construction emissions estimate that Staff used to calculate greenhouse gas emissions for the entirety of the construction activities. The greenhouse gas emissions estimate is presented below in **Greenhouse Gas Table 1**, where the GHG emissions were converted by staff into MTCO2E and totaled. (Ex. 300, p. C.1-67.)

Greenhouse Gas Table 1
Estimated Calico Solar Potential Construction Greenhouse Gas Emissions

Construction Element	CO_2-Equivalent (MTCO2E) [a,b]
On-Site Construction Equipment	4,988.20
On-Site Construction/Delivery Trucks	1,678.36
On-Site Construction/Worker/Security Vehicles	1,805.69
Off-Site Worker/Security Vehicles	13,954.82
Off-Site Delivery Trucks	17,028.23
On-site/Off-Site Train for Water Delivery	2,115.71
Construction Total	41,571.01

Source: Ex. 300, p. C.1-67, **Greenhouse Gas Table 2**

[a] One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.

[b] The vast majority of the CO2E emissions, over 99 percent, are CO_2 from these combustion sources.

The Applicant did not update the GHG emissions to reflect the changes to the project. However, based on the evidence, we find that the GHG emissions are expected to minimally decrease due to the proposed project modifications for the same reasons as identified in the **Air Quality** section of this Decision. (Ex. 300, p. C.1-67.)

There is no adopted, enforceable federal or state LORS applicable to Calico construction emissions of GHG. Nor is there a quantitative threshold over which

[2] California Energy Commission 2008, *2008 Integrated Energy Policy Report Update*, (IEPR) (CEC-100-2008-008-CMF.)

GHG emissions are considered “significant” under CEQA. Nevertheless, there is guidance from regulatory agencies on how the significance of such emissions should be assessed. For example, the most recent guidance from CARB staff recommends a “best practices” threshold for construction emissions. [CARB, Preliminary Draft Staff Proposal, Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act (Oct. 24, 2008), p. 9]. Such an approach is also recommended on an interim basis, or proposed, by major local air districts.

Staff concluded that the GHG emission increases from construction activities would not be significant environmental impacts for several reasons. First, the period of construction would be short-term and the emissions intermittent during that period, not ongoing during the life of the proposed project. Second, “best practices” control measures, such as limiting idling times and requiring, as appropriate, equipment that meet the latest emissions standards, will further minimize greenhouse gas emissions. The use of newer equipment will increase efficiency and reduce GHG emissions and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment. Lastly, this renewable energy source will provide power with very low GHG emissions, and the construction emissions will be offset by the reduction in fossil fuel fired generation that would be enabled by the proposed project. If the proposed project construction emissions were distributed over the 40 year life of the project they would only increase the project life time annual facility GHG emissions rate by 0.00056 MT CO2 eq per MW. (Ex. 300, pp. C.1-67 to C.1-70.)

Therefore, we find that the measures described above to directly and indirectly limit the emission of GHGs during construction of the Calico Solar Project are in accordance with current best practices. We also find the evidence shows that the GHG emissions from construction activities will not be significant.

4. Direct/Indirect Operation Impacts and Mitigation

a. <u>Anticipated Emissions</u>

Operation of the proposed Calico Solar Project will cause GHG emissions from the facility maintenance fleet and employee trips, emergency fire pump engine, and sulfur hexafluoride emissions from new electrical component equipment. (Ex. 300, p. Air-1, C.1-67.) **Greenhouse Gas Table 2** shows what the proposed project could potentially emit in greenhouse gases on an annual basis.

Greenhouse Gas Table 2
Estimated Calico Solar Potential Operating Greenhouse Gas Emissions

Operating Element	Annual CO_2-Equivalent (MTCO2E)[a]
Onsite Stationary Equipment Combustion [b]	0.82
Onsite Vehicle Combustion [b]	1,635.51
Onsite Train for Water Delivery [b]	153.75
Offsite Vehicle Combustion [b]	1,174.54
Offsite Train for Water Delivery [b]	140.19
Equipment Leakage (SF_6)	384.42
Total Project GHG Emissions – MTCO2E [b]	**3,488.22**
Facility MWh per year [c]	1,840,000
Facility GHG Performance (MTCO2E/MWh)	0.00190

Source: Ex. 300, p. C.1-68, **Greenhouse Gas Table 3**
[a] One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
[b] The vast majority of the CO2E emissions, over 99 percent, are CO_2 from these two emission sources.
[c] Approximately a 25 percent capacity factor.

The proposed project is estimated to emit, directly from primary and secondary emission sources on an annual basis, nearly 3,500 metric tonnes of CO_2-equivalent GHG emissions per year. The Calico Solar Project, as a renewable energy generation facility, is determined by rule to comply with the Greenhouse Gas Emission Performance Standard requirements of SB 1368 (Chapter 11, Greenhouse Gases Emission Performance Standard, Article 1, Section 2903 [b][1]). Regardless, the Calico Solar Project has an estimated GHG emission rate of 0.00190 MTCO2E/MWh, well below the Greenhouse Gas Emission Performance Standard of 0.500 MTCO2/MWh.

The Applicant did not update the GHG emissions to reflect the changes to the project. However, based on the evidence, we find that the GHG emissions are expected to minimally decrease due to the proposed project modifications for the same reasons as identified in the **Air Quality** section this Decision. (Ex. 300, p. C.1-68.)

b. Assessment of Operational Impacts

GHG emissions contribute to global impacts. While it may be true that in general, when an agency conducts a CEQA analysis of a proposed project, it does not need to analyze how the operation of the proposed project is going to affect the entire system of projects in a large multistate region, analysis of the impacts of GHG emissions from power plants requires consideration of the project's impacts on the entire electricity system.

California's electricity system – which is actually part of a system serving the entire western region of the U.S., Canada, and Mexico – is large and complex. Hundreds of power plants, thousands of miles of transmission and distribution lines, and millions of points of electricity demand operate in an interconnected, integrated, and simultaneous fashion. Because the system is integrated, and because electricity is produced and consumed instantaneously, and will continue to be until large-scale electricity storage technologies are available, any change in demand and, most important for this analysis, any change in output from any generation source, is likely to affect the output from all generators (*Committee Guidance on Fulfilling California Environmental Quality Act Responsibilities for Greenhouse Gas Impacts in Power Plant Siting Applications,* CEC-700-2009-004, pp. 20 to 22.) [3] (Hereinafter referred to as "Committee CEQA Guidance")

The California Independent System Operator (CAISO) is responsible for operating the system so that it provides power reliably and at the lowest cost. Thus the CAISO dispatches generating facilities generally in order of cheapest to operate (i.e., typically the most efficient) to most expensive (i.e., typically the least efficient). (*Id*., p. 20.) Because operating cost is correlated with heat rate (the amount of fuel that it takes to generate a unit of electricity), and, in turn, heat rate is directly correlated with emissions (including GHG emissions), when a power plant runs, it usually will take the place of another facility with higher emissions that otherwise would have operated. Due to the integrated nature of the electrical grid, the operational plant and the displaced plant may be hundreds of miles apart (Committee CEQA Guidance, p. 20.) Because one plant's operation could affect GHG emissions hundreds of miles away, the necessity of assessing their operational GHG emissions on a system-wide basis becomes clear.

As California moves towards an increased reliance on renewable energy, non-renewable energy resources will be displaced. These reductions in non-renewable energy, shown in **Greenhouse Gas Table 3**, could be as much as 36,500 GWh. These assumptions are conservative in that the forecasted growth in electricity retail sales assumes that the impacts of planned increases in expenditures on (uncommitted) energy efficiency are already included in the current retail sales forecast. Energy Commission staff estimates that as much as 18,000 GWh of additional savings due to uncommitted energy efficiency programs may be forthcoming. This would reduce non-renewable energy needs by a further 12,000 GWh given a 33 percent RPS.

[3] The report was issued in March 2009 and is found on the Commission website at: **http://www.energy.ca.gov/2009publications/CEC-700-2009-004-CEC-700-2009-004.PDF**

Greenhouse Gas Table 3
Estimated Changes in Non-Renewable Energy Potentially Needed to Meet California Loads, 2008-2020

California Electricity Supply	**Annual GWh**	
Statewide Retail Sales, 2008, estimated [a]	264,794	
Statewide Retail Sales, 2020, forecast [a]	298,697	
Growth in Retail Sales, 2008-20	24,903	
Growth in Net Energy for Load [b]	29,840	
California Renewable Electricity	**GWh @ 20% RPS**	**GWh @ 33% RPS**
Renewable Energy Requirements, 2020 [c]	57,939	95,600
Current Renewable Energy, 2008	29,174	
Change in Renewable Energy-2008 to 2020 [c]	28,765	66,426
Resulting Change in Non-Renewable Energy	176	(36,586)

Source: Ex. 300, p. C.1-71, **Greenhouse Gas Table 4**
Notes:

a. 2009 IPER Demand Forecast, Form 1.1c. Excludes pumping loads for entities that do not have an RPS.
b. 2009 IEPR Demand Forecast, Form 1.5a.
c. RPS requirements are a percentage of retail sales.

High GHG -emitting resources, such as coal, are effectively prohibited from entering into new contracts for California electricity deliveries as a result of the Emissions Performance Standard adopted in 2007 pursuant to SB 1368. Between now and 2020, more than 18,000 GWh of energy procured by California utilities under these contracts will have to reduce GHG emissions or be replaced; these contracts are presented in **Greenhouse Gas Table 4**. (Ex. 300, C.1-71.)

Greenhouse Gas Table 4
Expiring Long-term Contracts with Coal-fired Generation 2009 – 2020

Utility	Facility [a]	Contract Expiration	Annual GWh Delivered to CA
PG&E, SCE	Misc In-state Qual.Facilities [a]	2009-2019	4,086
LADWP	Intermountain	2009-2013	3,163 [b]
City of Riverside	Bonanza, Hunter	2010	385
Department of Water Resources	Reid Gardner	2013 [c]	1,211
SDG&E	Boardman	2013	555
SCE	Four Corners	2016	4,920
Turlock Irrigation District	Boardman	2018	370
LADWP	Navajo	2019	3,832
		TOTAL	**18,522**

Source: Ex. 300, p. C.1-72, **Greenhouse Gas Table 5**
Notes:
a. All facilities are located out-of-state except for the Miscellaneous In-state Qualifying Facilities.
b. Estimated annual reduction in energy provided to LADWP by Utah utilities from their entitlement by 2013.
c. Contract not subject to Emission Performance Standard, but the Department of Water Resources has stated its intention not to renew or extend.

This represents almost half of the energy associated with California utility contracts with coal-fired resources that will expire by 2030. If the State enacts a carbon adder[4], all the coal contracts (including those in **Greenhouse Gas Table 4**, which expire by 2020, and other contracts that expire beyond 2020 and are not shown in **Table 4**) may be retired at an accelerated rate as coal-fired energy becomes economically uncompetitive. Also shown are the approximate 500 MW of in-state coal and petroleum coke-fired capacity that may be unlikely to contract with California utilities for baseload energy due to SB1368 Emission Performance Standard. As these contracts expire, new and existing generation resources will replace the lost energy and capacity. Some will come from renewable generation; some will come from new and existing natural gas fired generation. All of these new facilities will emit substantially less GHG than the coal and petroleum coke-fired generation, which average about 1.0 $MTCO_2$/MWh without

[4] A carbon adder or carbon tax is a specific value added to the cost of a project for per ton of associated carbon or carbon dioxide emissions. Because it is based on, but not limited to, actual operations and emission and can be trued up at year end, it is considered a simple mechanism to assign environmental costs to a project.

carbon capture and sequestration, resulting in a net reduction in GHG emissions from the California electricity sector. (Ex. 300, p. C.1-72.)

The SWRCB has proposed substantial changes to once-through cooling (OTC) units, shown in **Greenhouse Gas Table 5**, which would likely require retrofit, retirement, or substantial curtailment of dozens of generating units. In 2008, these units collectively produced about 58,000 GWh. While the more recently built OTC facilities may well install dry or wet cooling towers, it is unlikely that the aging, merchant plants will do so. Most of these units already operate at low capacity factors, reflecting their limited ability to compete in the current electricity market. New resources would continue to out-compete aging plants, displacing the energy provided by OTC facilities and accelerating their retirement. (Ex. 300, p. C.1-72 to C.1.73.)

It must be noted, however, that a project like Calico Solar, located far from coastal load pockets such as the Greater Los Angeles Local Capacity Area, would more likely provide energy support to facilitate the retirement of some aging and/or OTC power plants, but would not likely provide any local capacity support at or near the coastal OTC units. We expect that local capacity and voltage support will increasingly be provided by newer, more-efficient natural gas and other forms of generation, including, to the extent practical, distributed generation resources such as rooftop solar. These resources will also help displace older, less-efficient generation and accelerate retirement of those units. Regardless, due to its low greenhouse gas emissions, Calico Solar will serve to reduce GHG emissions from the electricity sector. (Ex. 300, p. C.1-73.)

Greenhouse Gas Table 5
Units Utilizing Once-Through Cooling: 2008 Capacity and Energy Output [a]

Plant, Unit Name	Owner	Local Reliability Area	Aging Plant?	Capacity (MW)	2008 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
Diablo Canyon 1, 2	Utility	None	No	2,232	17,091	Nuclear
San Onofre 2, 3	Utility	L.A. Basin	No	2,246	15,392	Nuclear
Broadway 3 [b]	Utility	L.A. Basin	Yes	75	90	0.648
El Centro 3, 4 [b]	Utility	None	Yes	132	238	0.814
Grayson 3-5 [b]	Utility	LADWP	Yes	108	150	0.799
Grayson CC [b]	Utility	LADWP	Yes	130	27	0.896
Harbor CC	Utility	LADWP	No	227	203	0.509
Haynes 1, 2, 5, 6	Utility	LADWP	Yes	1,046	1,529	0.578
Haynes CC [c]	Utility	LADWP	No	560	3,423	0.376
Humboldt Bay 1, 2 [a]	Utility	Humboldt	Yes	107	507	0.683
Olive 1, 2 [b]	Utility	LADWP	Yes	110	11	1.008
Scattergood 1-3	Utility	LADWP	Yes	803	1,327	0.618
Utility-Owned				**7,776**	**39,988**	**0.693**
Alamitos 1-6	Merchant	L.A. Basin	Yes	1,970	2,533	0.661
Contra Costa 6, 7	Merchant	S.F. Bay	Yes	680	160	0.615
Coolwater 1-4 [b]	Merchant	None	Yes	727	576	0.633
El Segundo 3, 4	Merchant	L.A. Basin	Yes	670	508	0.576
Encina 1-5	Merchant	San Diego	Yes	951	997	0.674
Etiwanda 3, 4 [b]	Merchant	L.A. Basin	Yes	666	848	0.631
Huntington Beach 1, 2	Merchant	L.A. Basin	Yes	430	916	0.591
Huntington Beach 3, 4	Merchant	L.A. Basin	No	450	620	0.563
Mandalay 1, 2	Merchant	Ventura	Yes	436	597	0.528
Morro Bay 3, 4	Merchant	None	Yes	600	83	0.524
Moss Landing 6, 7	Merchant	None	Yes	1,404	1,375	0.661
Moss Landing 1, 2	Merchant	None	No	1,080	5,791	0.378
Ormond Beach 1, 2	Merchant	Ventura	Yes	1,612	783	0.573
Pittsburg 5-7	Merchant	S.F. Bay	Yes	1,332	180	0.673
Potrero 3	Merchant	S.F. Bay	Yes	207	530	0.587
Redondo Beach 5-8	Merchant	L.A. Basin	Yes	1,343	317	0.810
South Bay 1-4	Merchant	San Diego	Yes	696	1,015	0.611
Merchant-Owned				**15,254**	**17,828**	**0.605**
Total In-State OTC				**23,030**	**57,817**	

Source: Ex. 300, p. Air-1-13, **Greenhouse Gas Table 6**

a. OTC Humboldt Bay Units 1 and 2 are included in this list. They must retire in 2010 when the new Humboldt Bay Generating Station (not ocean-cooled), currently under construction, enters commercial operation.

b. Units are aging but are not OTC.

The proposed Calico Solar Project promotes the state's efforts to move towards a high-renewable, low-GHG electricity system, and, therefore, reduce the amount of natural gas used by electricity generation and greenhouse gas emissions. Its use of solar power, resultant limited GHG emissions, and likely replacement of older existing plant capacity, furthers the state's strategy to promote generation system efficiency and reduce fossil fuel use and GHG emissions.

Net GHG emissions for the integrated electric system will decline when new renewable power plants are added to: 1) move renewable generation towards the 33 percent target; 2) improve the overall efficiency, or GHG emission rate, of the electric system; or 3) serve load growth or capacity needs more efficiently, or with fewer GHG emissions. We find that the Calico Solar Project furthers the state's progress toward achieving these important goals and is consistent with the state policies we discussed in Section 2 of this chapter.

5. Cumulative Impacts on Greenhouse Gases

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or . . . compound or increase other environmental impacts." (CEQA Guidelines § 15355.) "A cumulative impact consists of an impact that is created as a result of a combination of the project evaluated in the EIR together with other projects causing related impacts." (CEQA Guidelines § 15130[a][1].) Such impacts may be relatively minor and incremental, yet still be significant because of the existing environmental background, particularly when one considers other closely related past, present, and reasonably foreseeable future projects.

GHG assessment is by its very nature a cumulative impact assessment. The Calico Solar Project will emit a limited amount of greenhouse gases and, therefore, this assessment presents the potential cumulative impact in the context of the project's effect on the electricity system, resulting GHG emissions from the system, and existing GHG regulatory requirements and GHG energy policies. The evidence supports our finding that the Calico Solar Project will not cause or contribute to a significant adverse cumulative impact due to GHG emissions, and will in fact result in a net reduction in GHG emissions across the electricity system providing energy and capacity to California. (Ex. 300, p. C.1-62.)

6. Closure and Decommissioning

Eventually the facility will close, either at the end of its useful life or due to some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, all sources of air emissions would cease to operate and thus impacts associated with those greenhouse gas emissions would no longer occur. The only other expected GHG emissions would be temporary equipment exhaust (off-road and on-road) from the dismantling activities. These activities would be of much a shorter duration than construction of the project, equipment is assumed to have lower comparative GHG emissions due to technology advancement, and would be required to be controlled in a manner at least equivalent to that required during construction. Therefore, we find that while there will be a temporary CEQA impact on GHG during decommissioning, it will be less than significant. (Ex. 300, p. C.1-73.)

7. Mitigation Measures/Proposed Conditions of Certification

No Conditions of Certification related to Greenhouse Gas emissions are proposed. The project owner will comply with any future applicable GHG regulations formulated by the ARB, such as GHG reporting or emissions cap and trade markets.

FINDINGS OF FACT

1. The GHG emissions from the Calico Solar Project construction are likely to be 41,571.01 $MTCO_2$ equivalent ("$MTCO_2E$") during the 41-month construction period.

2. There is no numerical threshold of significance under CEQA for construction-related GHG emissions.

3. The project owner will use best practices to control its construction-related GHG emissions.

4. Construction-related GHG emissions are less than significant if they are controlled with best practices.

5. State government has a responsibility to ensure a reliable electricity supply, consistent with environmental, economic, and health and safety goals.

6. California utilities are obligated to meet whatever demand exists from any and all customers.

7. Under SB 1368 and implementing regulations, California's electric utilities may not enter into long-term commitments with base load power plants with CO_2 emissions that exceed the Emissions Performance Standard ("EPS") of 0.500 $MTCO_2$ / MWh.

8. The maximum annual CO_2 emissions from Calico Solar operation will be 3,488.22 $MTCO_{2e}$, which constitutes an emissions performance factor of 0.00190 $MTCO_{2e}$ / MWh.

9. The SB 1368 EPS is applicable to the Calico Solar Project GHG emissions.

10. AB 32 requires CARB to adopt regulations that will reduce statewide GHG emissions, by the year 2020, to the 1990 level. Executive Order S-3-05 requires a further reduction, by the year 2050, to 80 percent below the 1990 level.

11. The California Renewable Portfolio Standard (RPS) requires the state's electric utilities obtain at least 33 percent of the power supplies from renewable sources, by the year 2020.

12. California's power supply loading order requires California utilities to obtain their power first from the implementation of all feasible and cost-effective energy efficiency and demand response, then from renewables and distributed generation, and finally from the most efficient available fossil-fired generation and infrastructure improvement.

13. There is no evidence in the record that construction or operation of the Calico Solar Project will be inconsistent with the loading order.

14. When it operates, the Calico Solar Project will displace generation from less-efficient (i.e., higher-heat-rate and therefore higher-GHG-emitting) power plants.

15. The Calico Solar Project will replace power from coal-fired power plants that will be unable to contract with California utilities under the SB 1368 EPS, and from once-through cooling power plants that must be retired.

16. Calico Solar Project operation will reduce overall GHG emissions from the electricity system.

17. The role of fossil fuel-fired generation will diminish as technology advances, coupled with efficiency and conservation measures, make round-the-clock availability of renewables generation feasible.

CONCLUSIONS OF LAW

1. Calico Solar construction-related GHG emissions will not cause a significant adverse environmental impact.

2. The GHG emissions from a power plant's operation should be assessed in the context of the operation of the entire electricity system of which the plant is an integrated part.

3. Calico Solar operational GHG emissions will not cause a significant environmental impact.

4. The SB 1368 EPS applies to the Calico Solar Project. Calico Solar has an estimated GHG emission rate of 0.00190 MTCO2E/MWh, well below the Greenhouse Gas Emission Performance Standard of 0.500 MTCO2/MWh.

5. Calico Solar operation will help California utilities meet their RPS obligations.

6. Calico Solar operation will be consistent with California's loading order for power supplies.

7. Calico Solar operation will foster the achievement of the GHG goals of AB 32 and Executive Order S-3-05.

8. The GHG emissions of any power plant must be assessed within the system on a case-by-case basis to ensure that the project will be consistent with the goals and policies enunciated above.

9. Any new power plant that we certify must:
    a) not increase the overall system heat rate;
    b) not interfere with generation from existing renewables or with the integration of new renewable generation; and
    c) have the ability to reduce system-wide GHG emissions.

B. AIR QUALITY

This analysis evaluates the expected air quality impacts from the emissions of criteria air pollutants from both the construction and operation of the Calico Solar Project. Criteria air pollutants are air contaminants for which the state and/or federal governments, per the California Clean Air Act and the federal Clean Air Act, have established an ambient air quality standard to protect public health. (Ex. 300, p. C.1-2.)

The criteria pollutants analyzed within this section are nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), and particulate matter (PM). Lead is not analyzed as a criteria pollutant, but lead and other toxic air pollutant emissions impacts are analyzed in the **Public Health** section of this Decision. Two subsets of particulate matter are inhalable particulate matter (less than 10 microns in diameter - PM10) and fine particulate matter (less than 2.5 microns in diameter - PM2.5). Nitrogen oxides (NO_X, consisting primarily of nitric oxide [NO] and NO_2) and volatile organic compound (VOC) emissions readily react in the atmosphere as precursors to ozone and, to a lesser extent, particulate matter. Sulfur oxides (SO_X) readily react in the atmosphere to form particulate matter and are major contributors to acid rain. (*Id.*)

The evidence includes an evaluation of the following four major issues:

- whether the Calico Solar Project is likely to conform with applicable federal, state, and Mojave Desert Air Quality Management District (MDAQMD or District) air quality laws, ordinances, regulations and standards (Title 20, California Code of Regulations, section 1744 (b));
- whether the project is likely to cause new violations of ambient air quality standards or contribute substantially to existing violations of those standards (Title 20, California Code of Regulations, section 1743);
- whether recommended mitigation measures are adequate to lessen potential impacts under CEQA to a level of insignificance (Title 20, California Code of Regulations, section 1742 (b)); and
- whether the project would exceed regulatory benchmarks identified and used by Staff to analyze NEPA air quality impacts, before or after implementation of recommended mitigation measures. (*Id.*)

The evidence establishes that with the adoption and implementation of the recommended Conditions of Certification the Calico Solar Project will meet the

provisions of all applicable air quality laws and will not result in any significant adverse air quality impacts. (Ex. 300, pp. C.1.1 to C-48.)

The Applicant modified the project boundary and significantly reduced the project footprint from 8,230 acres to 6,215 acres. The revisions to the project do not substantially change the worst-case onsite construction emissions and would reduce onsite operation emissions due to the reduction in the project footprint and vehicle travel requirements. Therefore, the modeling assessment conducted for the project continues to be valid. However, the Applicant did provide additional modeling analysis to show compliance with the new federal 1-hour NO_2 standard, which is included in the analysis. (Ex. 300, p. C.1-23.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

The federal Clean Air Act and the California Clean Air Act both require the establishment of standards for ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by the California Air Resources Board (CARB), are typically more protective than the federal AAQS, which are established by the U.S. Environmental Protection Agency (EPA). The standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (one hour, for instance), or to a relatively lower average concentration over a longer period (8 hours, 24 hours, or 1 month). **Air Quality Table 1** lists the state and federal AAQS**.** (Ex. 300, p. C.1-7.)

As shown in **Table 1**, the averaging times for the various air quality standards and the times over which they are measured, range from one-hour to annual averages. The standards are read as a concentration in parts per million (ppm), or as a weighted mass of material per a volume of air in milligrams or micrograms of pollutant in a cubic meter of air (mg/m^3 or $\mu g/m^3$, respectively.) (*Id.*)

In general, an area is designated as “attainment” if the concentration of a particular air contaminant does not exceed the standard. Likewise, an area is designated as “nonattainment” if the concentration of a particular contaminant standard is violated. Where there is insufficient data to support designation as either attainment or nonattainment, the area can be designated as unclassified. An area could be attainment for one air contaminant while nonattainment for

another, or attainment under the federal standard and nonattainment under the state standard for the same air contaminant. (Ex. 300, p. C.1-8.)

Air Quality Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8 Hour	0.075 ppm [a] (147 μg/m^3)	0.070 ppm (137 μg/m^3)
	1 Hour	—	0.09 ppm (180 μg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm (100 μg/m^3)	0.03 ppm (57 μg/m^3)
	1 Hour	0.100 ppm [b]	0.18 ppm (339 μg/m^3)
Sulfur Dioxide (SO_2)	Annual	0.030 ppm (80 μg/m^3)	—
	24 Hour	0.14 ppm (365 μg/m^3)	0.04 ppm (105 μg/m^3)
	3 Hour	0.5 ppm (1300 μg/m^3)	—
	1 Hour	—	0.25 ppm (655 μg/m^3)
Particulate Matter (PM10)	Annual	—	20 μg/m^3
	24 Hour	150 μg/m^3	50 μg/m^3
Fine Particulate Matter (PM2.5)	Annual	15 μg/m^3	12 μg/m^3
	24 Hour	35 μg/m^3	—
Sulfates (SO_4)	24 Hour	—	25 μg/m^3
Lead	30 Day Average	—	1.5 μg/m^3
	Calendar Quarter	1.5 μg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 μg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.01 ppm (26 μg/m^3)
Visibility Reducing Particulates	8 Hour	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

Source: Ex. 300, p. C.1-8.

Note:
[a] – The 2008 standard is shown above, but as of September 16, 2009 this standard is being reconsidered. The 1997 8-hour standard is 0.08 ppm.
[b] – The U.S. EPA is in the process of implementing this new standard, which became effective April 12, 2010. This standard is based on the 3-year average of the 98th percentile of the yearly distribution of 1-hour daily maximum concentrations.

1. Existing Air Quality

The project site is located in the Mojave Desert Air Basin (MDAB) under the jurisdiction of the MDAQMD. The San Bernardino County portion of the MDAB surrounding the project site is designated as non-attainment for the federal and state ozone and PM10 standards, and the state PM2.5 standard. This area is designated as attainment or unclassified for the state and federal CO, NO_X, SO_X, and the federal PM2.5 standards. **Air Quality Table 2** summarizes the area's attainment status for various applicable state and federal standards. (Ex. 300, p. C.1-9.)

Air Quality Table 2
Federal and State Attainment Status
San Bernardino County

Pollutant	Attainment Status [a]	
	Federal	State
Ozone	Moderate Nonattainment	Moderate Nonattainment
CO	Attainment	Attainment
NO_2	Attainment[b]	Attainment
SO_2	Attainment	Attainment
PM10	Moderate Nonattainment	Nonattainment
PM2.5	Attainment	Nonattainment

[a] Attainment = Attainment or Unclassified.
[b] Nitrogen dioxide attainment status for the new federal 1-hour NO_2 standard is scheduled to be determined by January 2012.

1. Construction Impacts and Mitigation

The proposed project will be located on approximately 6,215 acres, and will include the installation of 34,000 SunCatchers, operation of Solar Stirling Engine Power Conversion Units (PCUs), administration building, the maintenance building, and the substation building. The proposed project also includes the construction of a project substation, water treatment infrastructure, and onsite road construction. The project owner will use well water from the Lavic Groundwater Basin for construction and operation of the project. Water will be transported by a 0.51 mile long underground pipeline. (Ex. 300, pp. C.1-14 and C.1-16.)

Construction generally consists of site preparation, and construction and installation of major equipment and structures. Thus, there are two types of construction emissions fugitive emissions and combustion emissions. Fugitive dust comes from moving, disturbing, and traveling over the work site and roads, including grading/excavation and installation of linear facilities. Fuel combustion

emissions come from construction equipment exhausts, such as vehicles and heavy equipment/internal combustion engines. (Exs. 1, p. 5.10-16; 300, p. C.1-14.)

Air Quality Table 3 presents the Applicant's maximum annual construction-emission estimates. The **Table** shows that the maximum annual emissions are below the General Conformity Rule applicability thresholds for Ozone Precursors: NO_X (100 tons), VOC (100 tons) and PM10 (100 tons). (Ex. 300, p. C.1-17.)

Air Quality Table 3
Calico Solar Construction - Maximum Annual (12-Month) Emissions (tons/yr)

	NOx	SOx	CO	VOC	PM10	PM2.5
Onsite Construction Emissions						
Onsite Combustion Emissions	37.73	0.05	36.69	6.89	2.38	2.18
Onsite Fugitive Dust Emissions	---	---	---	---	71.72	10.39
Subtotal of Onsite Emissions	**37.73**	**0.05**	**36.69**	**6.89**	**74.10**	**12.57**
Offsite Emissions						
Offsite Combustion Emissions	57.83	0.12	64.48	13.97	3.80	3.33
Offsite Fugitive Dust Emissions	---	---	---	---	12.67	1.66
Subtotal of Offsite Emissions	**57.83**	**0.12**	**64.48**	**13.97**	**16.47**	**4.99**
Total Maximum Annual Emissions	**95.55**	**0.16**	**101.17**	**20.86**	**90.57**	**17.56**

Source: Ex. 300, p. C.1-17

Using estimated peak hourly, daily, and annual construction equipment exhaust emissions, the Applicant modeled Calico Solar Project's construction emissions to determine impacts. The Applicant's modeling analysis includes onsite fugitive dust and vehicle tailpipe emissions sources and control measures proposed by the Applicant. The modeling results are shown in **Air Quality Table 4**.[1] (Ex. 300, pp. C.1-21 to C.1-24.)

[1] Staff evaluated construction impacts by adding the modeled impacts to the available highest ambient background concentrations recorded during the previous three years from nearby monitoring stations. (Ex. 300, p. C.1-27.)

Air Quality Table 4
Calico Solar Maximum Project Construction Impacts

Pollutants	Avg. Period	Impacts ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Percent of Standard
NO_2	1-hr.	68.1	154.4	222.5	339	66%
	Annual	3.9	41.8	45.7	57	80%
PM10	24-hr	26.5	80	106.5	50	213%
	Annual	3.2	29.8	33.0	20	165%
PM2.5	24-hr	4.1	28	32.1	35	92%
	Annual	0.6	10.3	10.9	12	91%
CO	1-hr	61	4,025	4,086	23,000	18%
	8-hr	32	1,367	1,399	10,000	14%
SO_2	1-hr	0.07	47.2	47.3	665	7%
	3-hr	0.05	42.4	42.5	1300	3%
	24-hr	0.02	13.1	13.1	105	12%
	Annual	0.004	2.7	2.7	80	3%

Source: Exs.1. **Table 5.2-19** Revised; 300, p. C.1-24

As shown, with the exception of 24-hour and annual PM10 impacts, the Calico Solar Project will not create new exceedances. The modeling analysis also shows that with the exception of PM10 impacts, the project will not contribute to exceedances for any of the modeled air pollutants. (Ex. 300, p. C.1-22.)

However, in light of the existing PM10 and ozone-nonattainment status for the project area, Staff determined that the construction emissions of nonattainment pollutants and their precursors (NO_X, VOC, and PM emissions) are CEQA significant and therefore, the off-road equipment and fugitive dust emissions require mitigation. (*Id.*)

The modeling analysis also shows that with implementation of mitigation measures, project construction is not predicted to cause new exceedances of the NAAQS for attainment pollutants. (Ex. 300, p. C.1-25.)

2. Operation Impacts and Mitigation

The Calico Solar Project will be a nominal 663.5 MW solar electrical generating facility. While the direct air pollutant emissions from power solar generation are negligible, there are required auxiliary equipment and maintenance activities necessary to operate and maintain the facility. (Ex. 300, p. C.1-17.)

The results of the Applicant's modeling analysis of maximum annual operation emissions are well below the General Conformity Rule applicability thresholds for

PM10 (100) and ozone precursors (NO_X [100 tons] and VOC [100 tons]). **Air Quality Table 5** presents these estimates. (Ex. 300, p. C.1-20.)

Air Quality Table 5
Calico Solar Operations - Maximum Annual Emissions (tons/yr)

	NOx	SOx	CO	VOC	PM10	PM2.5
Onsite Operation Emissions						
Onsite Combustion Emissions	2.89	0.02	27.71	3.55	0.10	0.08
Onsite Gasoline Tank Emissions	---	---	---	0.09	---	---
Onsite Fugitive Dust Emissions	---	---	---	---	35.11	5.14
Subtotal of Onsite Emissions	2.89	0.02	27.71	3.64	35.21	5.23
Offsite Emissions						
Offsite Combustion Emissions	1.14	0.01	6.20	0.21	0.14	0.08
Offsite Fugitive Dust	---	---	---	---	5.37	0.30
Subtotal of Offsite Emissions	1.14	0.01	6.20	0.21	5.51	0.38
Total Maximum Annual Emissions	4.03	0.03	33.91	3.85	40.72	5.61

Source: TS 2010q and Staff estimates for the gasoline tank. Ex. 300, p. C.1-19

The Applicant also performed a modeling analysis using the EPA-approved AERMOD model to estimate the impacts of the project's NO_X, PM10, CO, and SO_X maintenance and stationary emissions resulting from project operation. **Air Quality Table 6** presents the results of the Applicant's modeling analysis.[2]

Air Quality Table 6
Calico Solar Operation Emission Impacts

Pollutants	Avg. Period	Impacts ($\mu g/m^3$)	Background [1] ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Percent of Standard
NO_2	1-hr.	47.8	154.4	202.2	339	61%
	1-hr Fed	51.8	129.6	181.3	188	96%
	Annual	0.3	41.8	42.1	57	74%
PM10	24-hr	2.8	80	82.8	50	166%
	Annual	0.6	29.8	30.4	20	152%
PM2.5	24-hr	0.4	28	28.4	35	81%
	Annual	0.1	10.3	10.4	12	87%
CO	1-hr	166	4,025	4,191	23,000	18%
	8-hr	72	1,367	1,439	10,000	14%
SO_2	1-hr	0.62	47.2	47.8	665	7%
	3-hr	0.22	42.4	42.6	1300	3%
	24-hr	0.07	13.1	13.2	105	13%
	Annual	0.001	2.7	2.7	80	3%

Source: Exs. 1, **Table 5.2-20** Revised; 300, p. C.1-27.

[2] Staff evaluated the operation impacts by adding the modeled impacts to the available highest ambient background concentrations recorded during the previous three years from nearby monitoring stations. (Ex. 300, p. C.1-27.)

As shown, with the exception of PM10 impacts, that the proposed project would not create new exceedances. The table further shows that with the exception of PM10 impacts, the proposed project will not contribute to existing exceedances for any of the modeled air pollutants. (Ex. 300, p. C.1-25.)

In light of the existing PM10 and ozone non-attainment status for the project area, Staff determined that the operating emissions of NO_X, VOC, and PM emissions are potentially CEQA significant and mitigation is required for the off-road equipment and fugitive dust emissions. (Ex. 300, p. C.1-25.)

The record further shows that based on the modeling analysis and with implementation of recommended mitigation measures, as adopted in the Conditions of Certification below, project operations will not cause new exceedances of NAAQS.

The record shows that the project's operating emissions are well below the General Conformity applicability thresholds for the federal PM10 and ozone nonattainment pollutants. (Ex. 300, pp. C.1-24 and C.1-45.)

3. Construction and Operation Overlap Impacts and Mitigation

For a period of time, the construction and operation of the facilities will overlap due to the staged construction and operation of the two phases. As discussed above, the record discloses Applicant's performance of various modeling analyses for worst-case emissions. These analyses include modeling for the worst-case onsite emissions associated with overlap between operation of Phase I and construction of Phase II. **Air Quality Table 7** presents the maximum annual construction/operation overlapping emissions. (Ex. 300, p. C.1-18.)

As shown, the maximum annual overlapping construction/operation emissions are below the General Conformity Rule applicability thresholds for PM10 [70 tons] and ozone precursors (NO_X [100 tons] and VOC [100 tons].). (Ex. 300, pp. C.1-21 to C.1-22.)

Furthermore, the Applicant's emissions analysis indicates that the mitigated construction/operation overlapping emissions would be no higher than those determined for the worst-case project construction period. (Ex. 300, pp. C.1-25 and C.1-26.) Staff therefore determined that no significant CEQA or adverse NEPA impacts would occur after implementation of the mitigation measures included in the Conditions of Certification adopted herein. (*Id*.)

Air Quality Table 7
Maximum Annual Construction/Operation Overlap Emissions (tons/year)

Construction						
	NOx	**SOx**	**CO**	**VOC**	**PM10**	**PM2.5**
Onsite Emissions						
Onsite Combustion Emissions	31.74	0.04	36.78	6.39	2.11	1.92
Onsite Fugitive Dust Emissions	--	--	--	--	65.55	9.72
Subtotal of Onsite Emissions	**31.74**	**0.04**	**36.78**	**6.39**	**67.65**	**11.64**
Offsite Emissions						
Offsite Combustion Emissions	53.36	0.12	65.33	13.17	3.56	3.11
Offsite Fugitive Dust	--	--	--	--	11.77	1.55
Subtotal of Offsite Emissions	**53.36**	**0.12**	**65.33**	**13.17**	**15.33**	**4.65**
Total Maximum Hourly Emissions	**85.11**	**0.16**	**102.11**	**19.56**	**82.98**	**16.30**
Operation						
	NOx	**SOx**	**CO**	**VOC**	**PM10**	**PM2.5**
Onsite Emissions						
Onsite Combustion Emissions	0.42	0.00	3.96	0.51	0.01	0.01
Onsite Gasoline Tank Emissions	--	--	--	0.09	--	--
Onsite Fugitive Dust Emissions	--	--	--	--	5.02	0.74
Subtotal of Onsite Emissions	**0.42**	**0.00**	**3.96**	**0.60**	**5.03**	**0.75**
Offsite Emissions						
Offsite Combustion Emissions	0.16	0.00	0.89	0.03	0.02	0.01
Offsite Fugitive Dust	--	--	--	--	0.77	0.04
Subtotal of Offsite Emissions	**0.16**	**0.00**	**0.89**	**0.03**	**0.79**	**0.05**
Total Maximum Hourly Emissions	**0.58**	**0.00**	**4.85**	**0.63**	**5.82**	**0.80**
Construction/Operation Overlap Totals						
	NOx	**SOx**	**CO**	**VOC**	**PM10**	**PM2.5**
Construction/Operation Overlap Total	**85.69**	**0.16**	**106.96**	**20.19**	**88.80**	**17.10**

Source: TS 2010e, **Table 2.2-6a**, and Staff estimates for the gasoline tank. Ex. 300, p. C.1-21.

4. Cumulative Impacts

Cumulative impacts result from the proposed project's incremental effect, together with other closely related past, present and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project. (Pub. Res. Code § 21083; Cal. Code Regs., tit. 14, §§ 15064(h), 15130, 15355.)

This analysis is concerned with criteria air pollutants. Such pollutants have impacts that are usually (though not always) cumulative by nature. Rarely would a project by itself cause a violation of a federal or state criteria pollutant standard. However, a new source of pollution may contribute to violations of criteria pollutant standards because of the existing background sources or foreseeable future projects. (Ex. 300, C.1-41.)

The record includes extensive analysis of cumulative impacts to air quality. The "Existing Ambient Air Quality" subsection describes the air quality background in San Bernardino County, including a discussion of historical ambient levels for

each of the significant criteria pollutants. The construction and operation subsections discuss the proposed project's contribution to the local existing background caused by project construction and operation. (*Id.*)

The record also contains a summary of projections for criteria pollutants by the MDAQMD's programmatic efforts to abate such pollution, an analysis of the project's localized cumulative impacts, and the project's direct operating emissions combined with other local major emission sources. (Ex. 300, pp. C.1-41 to C.1-43.)

As a solar power generation facility, the direct air pollutant emissions from power generation are negligible and the emission source would be limited to auxiliary equipment and maintenance activities. The emissions from the proposed project would be minimal compared to the other power generation facilities, and it is unlikely that the proposed project would have significant impact on particulate matter emissions. (Ex. 300, p. C.1-42.)

The applicable air quality plans do not outline any new control measures applicable to the proposed project's operating emission sources. Therefore, compliance with existing District rules and regulations would ensure compliance with air quality plans. (*Id.*)

The Applicant, in consultation with MDAQMD and San Bernardino County Land Use Service Department, confirmed that there are no projects within a six-mile radius from the Calico Solar Project site that are under construction or have received permits to be built or operate in the foreseeable future. Therefore, we find that no stationary sources requiring a cumulative modeling analysis exist within a six-mile radius of the proposed project site. (Ex. 300, C.1-44.)

In addition to the projects determined through consultation with the District, there are several pending solar and wind projects in the Newberry Springs/Ludlow Area that would be located within a few miles of the Calico Solar Project site, and there are dozens of other wind and solar projects that have applications pending with BLM in the California Desert District. This potential for significant additional development within the air basin and corresponding increase in air basin emissions is a major part of Staff's rationale for recommending Conditions of Certification **AQ-SC6** and **AQ-SC7** that are designed to mitigate the proposed project's cumulative impacts by reducing the dedicated on-site vehicle emissions and fugitive dust emissions during site operation. (*Id.*)

In addition, we find that because the project's cumulative air quality impacts have been mitigated to less than significant, there is no environmental justice impact for air quality. (*Id.*)

5. Compliance with LORS

The MDAQCD issued a Preliminary Determination of Compliance (PDOC) for the Calico Solar Project on June 4, 2009, and a Final Determination of Compliance on January 27, 2010, (MDAQMD 2010a). Compliance with all District rules and regulations was demonstrated to the District's satisfaction in the FDOC. The District's FDOC conditions are presented in the Conditions of Certification (**AQ-1 to AQ-15**). (Ex. 300, p. C.1-45.)

MDAQMD Rules 403 and 403.2 limit fugitive dust emissions in the project area. Implementation of Staff-recommended mitigation measures **AQ-SC3, AQ-SC4,** and **AQ-SC7,** which we hereby adopt, will reduce the project's contributions to fugitive dust emissions to below the level of significance. (Ex. 300, p. C.1-46.)

In addition, Staff recommend several other Conditions of Certification designed to reduce the project's air quality impacts to below the level of significance. We hereby adopt all of Staff's recommended Conditions of Certification, **AQ-SC1** through **AQ-SC15**. (*Id.*)

FINDINGS OF FACT

Based on the persuasive weight of the evidence of record, we find as follows:

1. The proposed Calico Solar Project in the Mojave Desert Air Basin and is under the jurisdiction of the Mojave Desert Air Quality Management District.

2. The San Bernardino County portion of the Mojave Desert Air Basin area is designated as nonattainment for federal and state ozone and PM10 standards, and the state PM 2.5 standard.

3. The project will not cause new violations of any NO_2, SO_2, PM2.5, or CO ambient air quality standards. Therefore, the NO_X, SO_X, PM2.5, and CO emission impacts are not significant.

4. The project's NO_X and VOC emissions can contribute to the existing violations of the ozone standards. However, the required mitigation will reduce the project's impact to a level that is less than significant.

5. The project's PM10 emissions can contribute to the existing violations of the ozone PM10 air quality standards. However, the required mitigation will mitigate the project's impacts to a level that is less than significant.

6. The Mojave Desert Air Quality Management District issued a Final Determination of Compliance imposing conditions of compliance on project construction and operation to ensure compliance with District Rules and Regulations. These Rules and Regulations are incorporated into the Conditions of Certification below.

7. The project's construction-related impacts are temporary and short-term in nature. They are mitigated to below a level of significance by measures identified in the Conditions of Certification.

8. The record contains an adequate analysis of the project's contributions to cumulative air quality impacts.

9. Projects, which have been constructed, undergoing construction, or otherwise reasonably foreseeable have been considered in the cumulative impact analyses of record. Impacts arguably attributable to such projects do not alter conclusions reached concerning the Calico Solar Project's contribution to cumulative air quality impacts.

10. Implementation of the Conditions of Certification listed below ensures that Calico Solar Project will not result in any significant direct, indirect, or cumulative adverse impacts to air quality.

CONCLUSION OF LAW

1. The Commission therefore concludes that the implementation of the Conditions of Certification will ensure that Calico Solar Project will conform with all applicable laws, ordinances, regulations, and standards relating to air quality as set forth in the pertinent portion of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

Staff conditions **AQ-SC1** through **AQ-SC4** and **AQ-SC7** are both CEQA and NEPA mitigation conditions. Staff Conditions **AQ-SC5**, **AQ-SC6**, and **AQ-SC8** are CEQA-only conditions. Note that the term "CPM" refers to the Energy Commission's Compliance Project Manager.

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Conditions of Certification **AQ-SC3**, **AQ-SC4** and **AQ-SC5** for the entire project

site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this Condition. The AQCMM shall not be terminated without written consent of the Compliance Project Manager (CPM).

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with Conditions of Certification **AQ-SC3**, **AQ-SC4,** and **AQ-SC5**.

Verification: At least 30 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The AQCMP shall include effectiveness and environmental data for the proposed soil stabilizer. The CPM will notify the project owner of any necessary modifications to the plan within 15 days from the date of receipt.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each Monthly Compliance Report that demonstrates compliance with the Air Quality Construction Mitigation Plan (AQCMP) mitigation measures for the purposes of minimizing fugitive dust emission creation from construction activities and preventing all fugitive dust plumes from leaving the project site. The following fugitive dust mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2**, and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

A. The main access roads through the facility to the power block areas will be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction in the main power block area, and delivery areas for operations materials (chemicals, replacement parts, etc.) will be paved or treated prior to taking initial deliveries.

B. All unpaved construction roads and unpaved operation and maintenance site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control. All other disturbed areas in the project and linear construction sites shall be watered as frequently as necessary during grading **(**consistent with **BIO-7)**; and after active construction activities shall be stabilized with a non-toxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods, in order to comply with the dust mitigation objectives of Condition of Certification **AQ-SC4**. The frequency of watering can be reduced or eliminated during periods of precipitation.

C. No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

D. Visible speed limit signs shall be posted at the construction site entrances.

E. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

F. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

G. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

H. All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

I. Construction areas adjacent to any paved roadway below the grade of the surrounding construction area or otherwise directly impacted by sediment from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures as specified in the Storm Water Pollution Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that this condition does not conflict with the requirements of the SWPPP.

J. All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when

construction activity occurs to prevent the accumulation of dirt and debris.

K. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.

L. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

M. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least 2 feet of freeboard.

N. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this Condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include the following to demonstrate control of fugitive dust emissions:

A. A summary of all actions taken to maintain compliance with this Condition;

B. Copies of any complaints filed with the District in relation to project construction; and

C. Any other documentation deemed necessary by the, CPM or AQCMM to verify compliance with this Condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (A) off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner or (B) 200 feet beyond the centerline of the construction of linear facilities indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if Step 1, specified above, fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or Delegate to shut down an activity, if the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include:

A. a summary of all actions taken to maintain compliance with this Condition;

B. copies of any complaints filed with the District in relation to project construction; and

C. any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this Condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the Monthly Compliance Report, a construction mitigation report that demonstrates compliance with the AQCMP mitigation measures for purposes of controlling diesel construction-related emissions. The following off-road diesel construction equipment mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2,** and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

a. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

b. All construction diesel engines with a rating of 50 hp or higher shall meet, at a minimum, the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good

faith effort to the satisfaction of the CPM that is certified by the on-site AQCMM demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 3 engine is not available for any off-road equipment larger than 50 hp, that equipment shall be equipped with a Tier 2 engine, or an engine that is equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NO_X) and diesel particulate matter (DPM) to no more than Tier 2 levels unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this Condition, the use of such devices is "not practical" for the following, as well as other, reasons.

1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question to Tier 2 equivalent emission levels and the highest level of available control using retrofit or Tier 1 engines is being used for the engine in question; or
2. The construction equipment is intended to be on site for 10 days or less.
3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not practical.

c. The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within 10 working days of the termination and that a replacement for the equipment item in question meeting the controls required in item "b" occurs within 10 days of termination of the use, if the equipment would be needed to continue working at this site for more than 15 days after the use of the retrofit control device is terminated, if one of the following conditions exists :

1. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.
2. The retrofit control device is causing or is reasonably expected to cause engine damage.
3. The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public.
4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

d. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (b) above

shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

e. All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.

f. Construction equipment will employ electric motors when feasible.

Verification: The AQCMM shall include in the Monthly Compliance Report the following to demonstrate control of diesel construction-related emissions:

A. A summary of all actions taken to control diesel construction related emissions;

B. A list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained; and

C. Any other documentation deemed necessary by the CPM, or the AQCMM to verify compliance with this Condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner, when obtaining dedicated on-road or off-road vehicles for mirror washing activities and other facility maintenance activities, shall only obtain vehicles that meet California on-road vehicle emission standards or appropriate U.S.EPA/California off-road engine emission standards for the latest model year when obtained.

Verification: At least 30 days prior to the start commercial operation, the project owner shall submit to the CPM a copy of the plan that identifies the size and type of the on-site vehicle and equipment fleet and the vehicle and equipment purchase orders and contracts and/or purchase schedule. The plan shall be updated every other year and submitted in the Annual Compliance Report .

AQ-SC7 The project owner shall provide a site Operations Dust Control Plan, including all applicable fugitive dust control measures identified in the verification of **AQ-SC3** that would be applicable to minimizing fugitive dust emission creation from operation and maintenance activities and preventing all fugitive dust plumes that would not comply with the performance standards identified in **AQ-SC4** from leaving the project site; that:

A. describes the active operations and wind erosion control techniques such as windbreaks and chemical dust suppressants, including their ongoing maintenance procedures, that shall be used on areas that could be disturbed by vehicles or wind anywhere within the project boundaries; and

B. identifies the location of signs throughout the facility that will limit traveling on unpaved portion of roadways to solar equipment maintenance vehicles only. In addition, vehicle speed shall be limited to no more than 10 miles per hour on these unpaved roadways, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

The site operations fugitive dust control plan shall include the use of durable non-toxic soil stabilizers on all regularly used unpaved roads and disturbed off-road areas, or alternative methods for stabilizing disturbed off-road areas, within the project boundaries, and shall include the inspection and maintenance procedures that will be undertaken to ensure that the unpaved roads remain stabilized. The soil stabilizer used shall be a non-toxic soil stabilizer or soil weighting agent that can be determined to be either as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control.

The performance and application of the fugitive dust controls shall also be measured against and meet the performance requirements of condition **AQ-SC4**. The measures and performance requirements of **AQ-SC4** shall also be included in the operations dust control plan.

Verification: At least 30 days prior to start of commercial operation, the project owner shall submit to the CPM for review and approval a copy of the site Operations Dust Control Plan that identifies the dust and erosion control procedures, including effectiveness and environmental data for the proposed soil stabilizer, that will be used during operation of the project and that identifies all locations of the speed limit signs.

Within 60 days after commercial operation, the project owner shall provide to the CPM a report identifying the locations of all speed limit signs, and a copy of the project employee and contractor training manual that clearly identifies that project employees and contractors are required to comply with the dust and erosion control procedures and on-site speed limits.

AQ-SC8 The project owner shall provide the CPM copies of all District issued Authority-to-Construct (ATC) and Permit-to-Operate (PTO) documents for the facility.

The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project federal air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. Environmental Protection Agency (U.S. EPA), and any revised federal permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any ATC, PTO, and proposed air permit modifications to the CPM within five working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified ATC/PTO documents and all federal air permits to the CPM within 15 days of receipt.

DISTRICT CONDITIONS

DISTRICT FINAL DETERMINATION OF COMPLIANCE CONDITIONS (MDAQMD 2010a)

District conditions **AQ-1** through **AQ-15** are CEQA-only required Conditions.

Application No. 00010423 (Emergency Generator)

EQUIPMENT DESCRIPTION:

ARB Certified Tier III engine, 399 bhp, fueled on ARB diesel, powering an electrical generator.

AQ-1 Engine may operate in response to notification of impending rotating outage if the area utility has ordered rotating outages in the area where the engine is located or expects to order such outages at a particular time, the engine is located in the area subject to the rotating outage, the engine is operated no more than 30 minutes prior to the forecasted outage, and the engine is shut down immediately after the utility advises that the outage is no longer imminent or in effect.

Verification: The project owner shall maintain engine operating records as required in **AQ-6** and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-2 This unit shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 0.0015 percent (15 ppm) on a weight per weight basis per ARB Diesel or equivalent requirements.

Verification: The project owner shall maintain the fuel sulfur content records for diesel fuel deliveries on site as required in **AQ-6** and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-3 This equipment shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-4 A non-resettable four-digit (9,999) hour timer shall be installed and maintained on this unit to indicate elapsed engine operating time.

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Energy Commission.

AQ-5 This unit shall be limited to use for emergency power, defined as in response to a fire or when commercially available power has been interrupted. In addition, this unit shall be operated no more than 50 hours per year, and no more than 0.5 hours per day for testing and maintenance, excluding compliance source testing. Time required for source testing will not be counted toward the 50 hour per year limit.

Verification: The project owner shall maintain engine use records on site as required in **AQ-6** and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-6 The project owner shall maintain an operations log for this unit current and on-site (or at a central location) for a minimum of five years, and this log shall be provided to District, State and Federal personnel upon request. The log shall include, at a minimum, the information specified below:

a. Date of each use and duration of each use (in hours);

b. Reason for use (testing & maintenance, emergency, required emission testing);

c. Calendar year operation in terms of fuel consumption (in gallons) and total hours; and,

d. Fuel sulfur concentration (the project owner may use the supplier's certification of sulfur content if it is maintained as part of this log).

Verification: The project owner shall submit records required by this Condition that demonstrating compliance with the sulfur content and engine use limitations of Conditions **AQ-2** and **AQ-5** in the Annual Compliance Report (**COMPLIANCE-8**), including a photograph showing the annual reading of engine hours. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-7 This gen-set is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115). In the event of conflict between these Conditions and the ATCM, the more stringent requirements shall govern.

Verification: The project owner shall submit the engine specifications at least 30 days prior to purchasing the engines for review and approval demonstrating that the engines meet both ATCM and New Source Performance Standard (NSPS) subpart IIII emission limit requirements at the time of engine purchase. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-8 This unit shall not be used to provide power during a voluntary agreed to power outage and/or power reduction initiated under an Interruptible Service Contract (ISC); Demand Response Program (DRP); Load Reduction Program (LRP) and/or similar arrangement(s) with the electrical power supplier.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

Application No. 00010422 (5,000 gallon Above Ground Non-Retail Gasoline Dispensing Facility)

EQUIPMENT DESCRIPTION:

5,000 gallon capacity gasoline tank with Phase I and Phase II vapor recovery.

AQ-9 The toll-free telephone number that must be posted is 1-800-635-4617.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-10 The project owner shall maintain a log of all inspections, repairs, and maintenance on equipment subject to Rule 461. Such logs or records shall be maintained at the facility for at least two years and shall be available to the District upon request.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-11 Any modifications or changes to the piping or control fitting of the vapor recovery system require prior approval from the District.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-12 The vapor vent pipes are to be equipped with pressure relief valves.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-13 The project owner shall perform the following tests within 60 days of construction completion and annually thereafter in accord with the following test procedures:

a. Static Pressure Decay Test per ARB test method TP-201.3B (2-inch test);

b. Dynamic Back Pressure test per TP-201.4;

c. Liquid Removal Test (if applicable) per TP-201.6;

d. Fuel dispensing rate not to exceed 10 gpm, verified per EO G-70-200-C Exhibit 4, and;

e. Emergency vents and manways shall be leak free when tested at the operating pressure of the tank in accordance with ARB test methods, as specified in Title 17, California Code of Regulations.

The District shall be notified a minimum of 10 days prior to performing the required tests with the final results submitted to the District within 30 days of completion of the tests.

The District shall receive passing test reports no later than six weeks prior to the expiration date of this permit.

Verification: The project owner shall notify the District at least 10 days prior to performing the required tests. The test results shall be submitted to the District within 30 days of completion of the tests and shall be made available to the CPM if requested.

AQ-14 The annual throughput of gasoline shall not exceed 500,000 gallons per year. Throughput Records shall be kept on site and available to District personnel upon request. Before this annual throughput can be increased the facility may be required to submit to the District a site specific Health Risk Assessment in accord with a District approved plan. In addition public notice and/or comment period may be required.

Verification: The project owner shall submit to the CPM gasoline throughput records demonstrating compliance with this Condition as part of the Annual Compliance Report .The project owner shall maintain on site the annual gasoline throughput records and shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-15 The project owner shall; install, maintain, and operate this equipment in compliance with ARB Executive Order G-70-200-C or Enhanced Vapor Recovery (EVR) Phase I and EVR Phase II, and Standing Loss requirements in affect at the time of construction.

Verification: The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

C. PUBLIC HEALTH

The public health analysis supplements the previous discussion on air quality and considers the potential public health effects from project emissions of toxic air contaminants. In this analysis, we review the evidence concerning whether such emissions will result in significant public health impacts or violate standards for public health protection.[1]

SUMMARY AND DISCUSSION OF THE EVIDENCE

Project construction and operation will result in routine emissions of toxic air contaminants for which no ambient air quality standards have been established. These substances are categorized as noncriteria pollutants. In the absence of standards, state and federal regulatory agencies have developed health risk assessment procedures to evaluate potential health effects due to these toxic air contaminants.

The risk assessment consists of the following steps:

- Identify the types and amounts of hazardous substances that the Calico Solar Project could emit into the environment;
- Estimate worst-case concentrations of project emissions in the environment using dispersion modeling;
- Estimate amounts of pollutants to which people could be exposed through inhalation, ingestion, and dermal contact;[2] and
- Characterize potential health risks by comparing worst-case exposure from the project with the scientific safety standards based on known health effects. (Ex. 300, p. C.6-3.)

Typically, the initial health risk analysis is performed at a "screening level," which is designed to estimate potential health risks. The risks for screening purposes are based on examining conditions that would lead to the highest, or worst-case,

[1] This Decision discusses other potential public health concerns under various topics. For instance, the accidental release of hazardous materials is discussed in **Hazardous Materials Management** and **Worker Safety and Fire Protection**. Electromagnetic fields are discussed in **Transmission Line Safety and Nuisance**. Potential impacts to soils and surface water sources are discussed in the **Soil and Water Resources** section of this Decision. Potential exposure to contaminated soils and hazardous wastes is described in **Waste Management** section of this Decision.

[2] Exposure pathways, or ways in which people might come into contact with toxic substances, include inhalation, dermal (through the skin) absorption, soil ingestion, consumption of locally grown plant foods, and mother's milk.

risks and then modeling those conditions to analyze results. Such conditions include:

- Using the highest levels of pollutants that could be emitted from the power plant;
- Assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- Using the type of air quality computer model which predicts the greatest plausible impacts;
- Calculating health risks at the location where the pollutant concentrations are estimated to be the highest;
- Assuming that an individual's exposure to cancer-causing agents occurs continuously for 70 years; and
- Using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses). (Ex. 300, pp. C.6-3 to C.6-4.)

The risk assessment for the Calico Project addresses two categories of potential health impacts: chronic (long-term) non-cancer effects and cancer risk (also long-term). Chronic non-cancer health effects occur as a result of long-term exposure (8 to 70 years) to lower concentrations of pollutants. For carcinogenic substances, the health assessment considers the total risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. (Ex. 300, pp. C.6-4 – C.6-5.)

The analysis for chronic health effects compares the maximum project contaminant levels to safe levels called Reference Exposure Levels or RELs. These exposure levels are designed to protect the most sensitive individuals in the population such as infants, the elderly, and people suffering from illness or disease, which make them more susceptible to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effects reported in medical and toxicological literature, and include margins of safety.

The assessment considers risk from all cancer-causing chemicals from the source of emissions. The calculated risk is not meant to predict the actual expected incidence of cancer, but is rather a theoretical estimate based on worst-case assumptions.

Cancer risk is expressed in chances per million and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer, and the length of the exposure period. Cancer risks for each

carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions means that actual cancer risks due to project emissions are likely to be considerably lower than those estimated. (Ex. 300, p. C.6-5.)

If the screening analysis predicts no significant risks, then no further analysis is required. However, if the predicted risk is significant, then further analysis using more realistic, site-specific assumptions is performed to obtain a more accurate assessment of potential health risks. If the site-specific analysis confirms that the risk exceeds the significance level, then appropriate mitigation measures are necessary to reduce the risk to less than significant. If a refined analysis identifies a cancer risk that exceeds the significance level after all risk reduction measures have been considered, then Staff would not recommend approval of the project. (Ex. 300, p. C.6-6.)

The evidence shows that both the Applicant and Staff independently performed screening risk assessments and concluded that no adverse health effects are expected from project construction or operation.

1. Construction Impacts and Mitigation

Construction of the Calico Solar Project is anticipated to take place over a period of 48 months. Potential construction-phase health impacts could occur from exposure to toxic substances in contaminated soil disturbed during site preparation and to diesel exhaust from heavy equipment. Excavation, grading, and earth moving activities also have potential to affect public health through mechanisms such as windblown dust, soil erosion, and the uncovering of hazardous substances. (Exs. 1, p. 5.16-1; 300, pp. C.6-10 – C.6-11.)

A Phase I Environmental Site Assessment identified no “Recognized Environmental Conditions” (i.e., found no evidence or record of any use, spillage, or disposal of hazardous substances on the site). If, however, any unexpected contamination is encountered during construction, then compliance with Conditions of Certification **Waste-1** and **Waste-2** will ensure that contaminated soil does not affect the public. These Conditions require a registered professional engineer or geologist to be available during soil excavation and grading to ensure proper handling and disposal of contaminated soil. (Ex. 302, p. C.6-10.)

With respect to the air emissions from diesel-fueled engines, the Applicant estimated worst-case emissions of 457 pounds per day of particulate matter less

than 10 microns in diameter (PM10) and 57.56 pounds per day and 71 pounds of per day of fine particulate matter less than 2.5 microns in diameter (PM2.5) during construction. (Exs. 1, § 5.2, Table 5.2-2-0 Revised; 10, § 5.2.) Because assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a period from eight to 70 years, the Applicant did not estimate the health risks resulting from the short duration of the construction activities. Similarly, Staff did not conduct a quantitative assessment of construction impacts on public health given the distance from the site to the sparsely populated area surrounding the site and based on its prior experience using quantitative risk assessment tools showing that construction vehicle emissions impacts are generally less than significant. (Exs. 1, p. 5.16-4; 300, p. C.6-11.)

Even though the Applicant and Staff independently determined that the construction impacts would be less than significant, they both proposed mitigation measures to reduce the maximum calculated PM10 and PM2.5 emissions and further reduce any potential impacts. (Ex. 1, § 5.2; 300, p. C.6-11.) We have adopted the recommended mitigation measures the **Air Quality** section of this Decision. Included in these measures are requirements for use of aggressive fugitive dust and diesel exhaust control measures. For instance, these Conditions will reduce exposure to diesel emissions from construction equipment by requiring the use of ultra-low sulfur diesel fuel and Tier 2 or Tier 1 California Emission Standards for Off-Road Compression-Ignition Engine or the installation of an oxidation catalyst and soot filters on diesel equipment.

2. Operation Impacts and Mitigation

The record shows that the only stationary source of toxic air contaminants (TAC) that would be emitted from the Calico Solar Project would be diesel particulate matter from the emergency generator which will be operated once a month for about 20 minutes. (Ex. 300, pp. C.6-11-C.6-14.) Mobile sources of TAC emissions during operations would include gasoline-fueled and diesel-fueled maintenance and delivery vehicles as well as visitor and staff traffic

The record includes the methodology used in identifying and quantifying the emission rates of the toxic noncriteria pollutants that could adversely affect public health. As shown in **Public Health Table 1** below, both the chronic hazard index and the cancer risk are below the level of significance indicating that no long-term adverse health effects are expected.

PUBLIC HEALTH Table 1
Operation Hazard/Risk at Point of Maximum Impact: Applicant Assessment

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
Acute Noncancer	0.062	1.0	No
Chronic Noncancer	0.00000042	1.0	No
Individual Cancer	0.000667 in 1 million	10.0 in 1 million	No

Source: Ex. 302, p. C.6-13.

The record shows that Staff performed an independent qualitative analysis of the risk assessment results using the Applicant's emission factors and considering several specified aspects of facility operations. Staff's results for acute hazard index are lower than the results reported by the Applicant due to a change in the acute REL for acrolein from the value used in the Applicant's August 2009 report (0.19 ug/m^3) to the value published by OEHHA in their December 2008 guidance, 2.5 ug/m^3. (Ex. 300, p. C.6-13.)

The point of maximum impact, PMI, was determined under the 70 year residential scenario. Three nearby residences, the only residential receptors located near the facility, were also modeled. Cumulative impacts were not evaluated as there are no existing or proposed projects within sic miles of the facility.

Public Health Table 2
Operation Phase Emission Rates Listed in Response to Data Requests

Substance	Diesel Generator	Washing Vehicle (running & idling)	LRU Maintenance Truck (running & Idling)	Staff & visitor cars, van pool, security truck	Diesel Delivery Trucks	Total Emissions
Peak Hourly Emissions from all vehicles of each type (lb/hr)						
DPM	0.015				0.027	0.042
Benzene		0.024	0.014	0.036		0.074
1,3-Butadiene		0.002	0.001	0.002		0.005
Formaldehyde		0.010	0.006	0.005		0.022
Acetaldehyde		0.005	0.003	0.004		0.012
Acrolein		0.001	0.000	0.000		0.002

Substance	Diesel Generator	Washing Vehicle (running & idling)	LRU Maintenance Truck (running & Idling)	Staff & visitor cars, van pool, security truck	Diesel Delivery Trucks	Total Emissions
Annual Emissions from all vehicles of each type (lb/yr)						
DPM	0.18				13.40	13.58
Benzene		69.78	39.08	36.28		145.14
1,3-Butadiene		5.17	2.90	2.51		10.58
Formaldehyde		29.80	16.69	5.43		51.92
Acetaldehyde		13.45	7.53	4.27		25.25
Acrolein		2.29	1.28	0.30		3.87

Source: Ex. 302, p. C.6-15.
Note: Values listed are for emissions from all vehicles of each type
DPM = diesel particulate matter

The Applicant's screening health risk assessment for the project resulted in an acute Hazard Index (HI) of 0.062 and a chronic HI of 0.00000042 at the point of maximum impact (PMI). The worst-case individual cancer risk was calculated to be 0.000667 in 1 million at the PMI. As **Public Health Table 1** shows, both the acute and chronic hazard indices and the maximum cancer risk are below the level of significance, indicating that no long-term or short-term cancer or non-cancer health effects are expected. (Ex. 300, p. C.6-12.)

Nonetheless, in order to reduce public health impacts, several administrative changes were made from the original proposal. During construction, unpaved roads would be sealed, vehicle trip lengths would be reduced and the option of using alternatively fueled vehicles would be investigated. In order to reduce public health impacts during operations, the diesel fire water pump would be changed to an electric unit, gasoline-powered vehicles for mirror wash and other maintenance vehicles would be used instead of diesels, and gasoline, electric and/or hybrid, vehicles would be used on-site. The remaining stationary emitting unit is the diesel-fueled emergency generator, for which the Applicant is continuing to investigate the possibility of using gasoline or other alternative fuels. The emergency generator will be used four hours/year for testing purposes. (Ex. 300, p. C.6-13.)

For the operations phase, atmospheric dispersion modeling of facility emissions was conducted by the Applicant using AERMOD and the risk assessment was conducted using the CARB/OEHHA Hotspots Analysis and Reporting Program

(HARP), Version 1.4a. The HARP On-Ramp program was used to load the AERMOD results into HARP. Local meteorological data were used and building downwash effects were included for five buildings. Potential risks to 5,211 grid receptors and 3 sensitive receptors were modeled. Exposure pathways assessed include inhalation, ingestion of home-grown produce, dermal absorption, soil ingestion and mother's milk. (Ex. 300, p. C.6-13.)

Staff conducted additional HARP modeling in which the one-hour emissions reported in the HARP files for each mobile source were multiplied by a factor of 2,880 hours/year, which assumes operation of vehicles for eight hours/day, 30 days/month for 12 months/year which is the rate at which the washing and LRU vehicles are expected to operate. For some vehicles this may be an underestimation (security vehicles are expected to run 24 hrs/day) or an overestimation (staff and vanpool vehicles are expected to run two hrs/day). Cancer risk and chronic hazard index modeled by Staff in this analysis are less than the significance levels of 10 in 1 million for cancer risk and 1.0 for hazard index. (Ex. 300, p. C.6-14.)

3. Cumulative Impacts

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit.14, § 15130). NEPA states that cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR §1508.7.)

Cumulative impacts can occur if implementation of the Calico Solar Project could combine with those of other local or regional projects. Cumulative impacts would occur locally if Calico Solar Project impacts combined with impacts of projects located within the same air basin. Cumulative impacts could also occur as a result of development of some of the many proposed solar and wind development projects that have been or are expected to be under consideration by the BLM and the Energy Commission in the near future. Many of these projects are located within the California Desert Conservation Area, as well as on BLM land in Nevada and Arizona. The geographic extent for the analysis of local cumulative impacts associated with the Calico Solar Project includes the Mojave Desert Air

Basin (MDAB), which contains most of San Bernardino County and parts of Riverside County and Kern County. (Ex. 300, p. C.6-22.)

Cumulative impacts of the proposed project and other projects within a six-mile radius were not evaluated by the Applicant. However, there is a potential for substantial future development in the project area and throughout the southern California desert region, including several energy projects employing solar or wind technologies. (Ex. 300, p. C.6-22.)

The maximum cancer risk for emissions from the Calico Solar Project is 2.7 in one million at the point of maximum impact located at the project fenceline. The maximum impact location occurs where pollutant concentrations from the Calico Solar Project would theoretically be the highest. Even at this location, we do not expect any significant change in lifetime risk to any person, and the increase does not represent any real contribution to the average lifetime cancer incidence rate due to all causes. Modeled facility-related residential risks are lower at more distant locations, and actual risks are expected to be much lower since worst-case estimates are based on conservative assumptions and thus overstate the true magnitude of the risk expected. Therefore, we do not consider the incremental impact of the additional risk posed by the Calico Solar Project to be either individually or cumulatively significant. (Ex. 300, p. C.6-23.)

Any emissions from construction of these projects would be dispersed over southeastern California, southern Nevada, and western Arizona and would not result in chronic health problems to sensitive receptors. Operation of the future solar and wind energy projects would result in negligible emissions, mostly related to worker vehicles and maintenance trucks, therefore, operation of these future projects would not result in negative regional health effects. (*Id*.)

Public health impacts of the Calico Solar Project would not combine with impacts of any past, present, or reasonably foreseeable projects to result in cumulatively considerable local or regional impacts.

4. Public Benefits

The evidence shows that a solar electric generating facility such as the proposed Calico Solar project would emit significantly fewer TACs than other energy sources available in California such as natural gas or biomass, thereby reducing the health risks that would otherwise occur with these non-renewable energy sources. At the same time, the proposed Calico Solar Project would provide

much needed electrical power to California residences and businesses at the time of greatest load (hot afternoons). It is documented that during heat waves in which elevated air-conditioning use has caused an electrical blackout, hospitalizations and deaths due to heat stroke increased. (Ex. 302, p. C.6-24.)

5. Compliance with Laws, Ordinances, Regulations and Standards (LORS)

The evidence reflects that the project will comply with all applicable LORS with implementation of the Conditions of Certification we adopt in this Decision.

FINDINGS OF FACT

Based on the evidence, we make the following findings and conclusions:

1. Construction and operation of the project will result in the routine release of criteria and noncriteria pollutants that have the potential to adversely impact public health.

2. Exposure to diesel particulate emissions from construction equipment is short-term and will not result in long-term carcinogenic or non-cancer effects.

3. Exposure to construction-related diesel particulates will be mitigated to the extent feasible by implementing measures to reduce equipment emissions.

4. Exposure to fugitive dust due to excavation and construction activities will be mitigated to insignificant levels by implementing measures to reduce dust production and dispersal.

5. Emissions of criteria pollutants, as discussed in the **Air Quality** section of this Decision, will be mitigated to levels consistent with applicable state and federal standards.

6. Emissions of noncriteria pollutants or toxic air contaminants are assessed according to procedures developed by state and federal regulatory agencies to evaluate potential health effects.

7. Emissions of toxic air contaminants from the project will not cause acute or chronic non-cancer adverse public health effects or long-term carcinogenic effects at the points of maximum impact.

8. The maximum cancer and non-cancer health risks associated with the project are below the significance thresholds commonly accepted for risk analysis purposes.

9. Since the project's contributions to health risks are well below the significance level, the project is not expected to contribute significantly to a cumulative health impact.

CONCLUSIONS OF LAW

1. Project emissions of toxic air contaminants do not pose a significant direct, indirect, or cumulative adverse public health risk.

2. With the implementation of the Conditions of Certification listed in the **Air Quality** and **Waste Management** and sections of this Decision, the project will not result in significant public health impacts during construction or operation.

3. The project will comply with the applicable laws, ordinances, regulations, and standards specified in the appropriate portion of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

No conditions of certification or mitigation measures are proposed.

D. WORKER SAFETY AND FIRE PROTECTION

Worker safety and fire protection measures are mandated by federal, state, and local laws, ordinances, regulations, and standards (LORS). Workers at industrial facilities, such as this project site, routinely operate equipment and handle hazardous materials. Such workers face hazards, including serious physical injury, resulting from on-site accidents. Protection measures are employed to eliminate these hazards or minimize their risk of harm through special training, protective equipment, and procedural controls. The purpose of this section is to determine whether the Applicant's proposed health and safety plans are in accordance with all applicable LORS and thus legally adequate for the protection of industrial workers. This section addresses the availability and adequacy of fire protection and emergency response services, as well as threats from wildland fires. As required by CEQA, this section also addresses the project's impacts on local fire protection services. Under the CEQA Guidelines, a project may have a significant impact if it would adversely impact acceptable levels of service for fire protection [Guidelines Appendix G]. (8/6/10 RT 122-219, Exs. 1, §5.17, Appendix B; 300, §§ B.3, C.15; 113, 300; 310; 1100 – 1105.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Worker Safety

Industrial environments are dangerous during both construction and operation. The Calico Solar Project will expose workers to loud noise, moving equipment, trenches, and confined space ingress and egress. Workers may fall and trip, and suffer burns, lacerations, and other injuries. The project also exposes workers to the possibility of falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks or electrocution. It is necessary for the Calico Solar Project to have well-defined policies and procedures, training, and hazard recognition and controls to minimize the risks posed by these hazards and to protect workers. If the facility complies with all applicable LORS, workers will be afforded legally adequate protection from these health and safety hazards. (Ex. 300, p. C.15-5.)

The Calico Solar Project will present construction and operational risks to workers typical of other solar power projects. In addition, the facility will pose risks associated with use of 34,000 pounds of hydrogen as a working gas. The risk to workers is minimized through onsite generation (which reduces storage of

hydrogen) and through rigorous safety management practices required by applicable LORS. (8/6/10 RT 162; Ex. 300, pp. C.15-5 - C.15-6.)

The project owner will prepare a Safety and Health Program to minimize worker hazards during construction and operation of the project. (Exs. 1, pp. 5.17-2–5.17-7, 5.17-7–5.17-12; 300, pp. C.15-5 – C.15-11.) The construction safety and health program (Title 8 of the California Code of Regulations, section 1502 et seq) will incorporate the orders promulgated by Cal/OSHA and over 20 additional state programs or requirements that address worker safety. The Applicant has included outlines of these required programs in the AFC. (Exs.1, Appen. B; 300, p. C.15-7.) Safety training will be an integral part of this worker safety program. We adopt Condition of Certification **WORKER SAFETY-1** to ensure that the project owner implements these programs and plans prior to the start of construction. (Ex. 300, pp. C.15-5 - C.15-7.)

The safety and health program for plant operation will include an injury and illness prevention program, an emergency action plan, a fire prevention program, and a personal protective equipment program. As with the construction program, worker safety-training will be an essential element of the operation program. To ensure that the programs will be in place before construction and operation begin, we have adopted Conditions of Certification **WORKER SAFETY-1 and -2**. (Ex. 300, pp. C.15-7 to C.15-11.)

This solar power plant will present a unique work environment that includes a solar field located in the high desert. The area under the SunCatchers must be kept free from weeds and thus herbicides will be applied as necessary. Worker exposure to these herbicides by inhalation and ingestion of dusts containing the herbicides poses a health risk. Workers will regularly inspect the SunCatchers for broken or non-functioning mirrors, and will clean and service the mirrors on a regular schedule. All these activities will take place year-round, including the summer months of peak solar power generation, when outside ambient temperatures routinely reach 115°F and above. (Ex. 300, p. C.15-10.) While the Applicant has indicated that workers will be adequately trained and protected, the Applicant has not included specific precautions to prevent heat stress and exposure to herbicides. Therefore, to protect workers from these risks and minimize their effects to less than significant levels, we have incorporated into Conditions of Certification **WORKER SAFETY-1** and **WORKER SAFETY-2** requirements for heat illness prevention and management of herbicides. (Ex. 300, pp. C.15-10 – C.15-11.)

Protecting construction workers from injury and disease is one of today's greatest challenges in occupational safety and health. (Ex. 300, pp. C.15-11 – C.15-13.) These hazards increase in complexity in multi-employer worksites typical of large, complex industrial projects like gas-fired power plants. There are no OSHA or Cal-OSHA requirements that an employer hire or provide for a construction safety officer, but doing so has become standard industry practice in view of OSHA and Cal-OSHA regulations requiring an employer to provide safety. To satisfy the intent of the Cal-OSHA regulations to provide for a safe workplace during power plant construction, we adopt Condition of Certification **WORKER SAFETY-3**, which requires the project owner to designate and provide for a project site construction safety supervisor.

Accidents, fires, and a worker death have occurred at Energy Commission-certified power plants in the recent past because of both the failure to recognize and control safety hazards and the inability to monitor compliance with occupational safety and health regulations. (Ex. 300, pp. C.15-11 – C.15-12.) In order to reduce and/or eliminate these hazards, we find that a professional Safety Monitor must be on-site to track compliance with Cal-OSHA regulations and periodically audit safety compliance during construction, commissioning, and the hand-over to the operations staff. Therefore, we adopt Condition of Certification **WORKER SAFETY-4,** which requires the project owner to hire a Safety Monitor. The Safety Monitor will be hired by the project owner but required to report to the Chief Building Official (CBO) and the Compliance Project Manager (CPM).

2. Valley Fever

Coccidioidomycosis or "Valley Fever" (VF) is primarily encountered in southwestern states, particularly Arizona and California. It is caused by inhaling the spores of the fungus *Coccidioides immitis*, which are released from the soil during soil disturbance (e.g., during construction activities) or wind erosion. The disease usually affects the lungs and can have potentially severe consequences, including hospitalization and death. The eastern side of San Bernardino County, including the Mojave Desert where the plant will be sited, experiences high rates of Valley Fever. (Ex. 300, p. C.15-13.)

The available scientific and medical literature on Valley Fever shows that there is some potential for Valley Fever to impact workers during construction and operation of the proposed project. However, the high number of cases reported in Kern County indicates that the project site may have an elevated risk for exposure. (Ex. 300, pp. C.15-13 - C.15-19.) To minimize exposure of workers

and the public to VF during soil excavation and grading, the project owner must employ extensive wetting of the soil prior to and during construction activities and require the use of dust masks at certain times during these activities. The dust (PM10) control measures set forth in the **Air Quality** section of this Decision must be strictly adhered to in order to adequately reduce the risk of contracting VF. Therefore, we adopt Condition of Certification **WORKER SAFETY-9,** which supplements the dust control measures found in Conditions **AQ-SC3** and **AQ-SC4** with additional requirements for development and implementation of a dust control plan.

3. Fire Protection and Emergency Response

a. Fire Protection

Electrical sparks, combustion of fuel oil, natural gas, hydraulic fluid, mineral oil, insulating fluid at the project power plant switchyard or flammable liquids, explosions, and overheated equipment, are all potential sources of small fires on the project site. (Ex. 300, p. C.15-18.) However, major structural fires, and fires and explosions of natural gas or other flammable gasses or liquids, are rare at most power plants. Indeed, according to the evidence, compliance with all LORS is usually adequate to ensure protection from all fire hazards associated with the project. (*Id*.)

Similarly, wildland fires that would use local vegetation as fuel are not likely to be caused by this project, as the Applicant will remove all vegetation in the vicinity of the solar power towers, substation and administration areas, and to cut and maintain vegetation in the solar field. Also, the access road along the perimeter fence lines of the project site will serve as a fire break. (Ex. 300, p. C.15-19.)

During construction and operation, the project will rely on both on-site fire protection systems and local fire protection services. The on-site fire protection system will provide the first line of defense for small fires. A major fire will require support services from the San Bernardino County Fire Department (SBCFD), including trained firefighters and equipment for a sustained response. (Ex. 300, p. C.15-19.) If warranted, mutual aid might be sought from and provided by other entities, including the Newberry Springs Fire Department. (8/6/10 RT 193, 211-213, Ex. 300, p 15-22.)

During construction, portable fire extinguishers will be located and maintained throughout the site and safety procedures and training will be implemented. (Ex.

300, p. C.15-19.) During operation, the project owner shall meet the fire protection and suppression requirements of the California Fire Code, all applicable recommended National Fire Protection Association (NFPA) standards, and all Cal-OSHA requirements. (Ex. 300, p. C.15-19.) The fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. The primary source of fire protection water will be 175,000 gallons stored in the demineralized water tank. A diesel firewater pump will increase the water pressure to the level required to serve all fire fighting systems. In addition, the Applicant is expected to implement a number of Applicant-proposed protective measures that would reduce the potential for harm to plant personnel and damage to facilities, including removal of all vegetation in the vicinity of the substation and administration areas. These measures are detailed in the record. (Exs. 1, pp. 5.17-14 to 5.17-7; 300, p. C.15-19.)

In addition to the fixed fire protection system, smoke detectors, flame detectors, high-temperature detectors, appropriate class of service portable extinguishers, and fire hydrants must be located throughout the facility at NFPA-approved intervals. These systems are standard requirements of the fire code and NFPA. Implementation of these systems will ensure adequate fire protection and Conditions of Certification **WORKER SAFETY-1** and **WORKER SAFETY-2** will ensure adequate on-site fire protection. (Ex. 300, pp. C.15-19 to C.15-20.)

With respect to off-site emergency access to the project by SBCFD or any other responder, the evidence establishes that two access gates and roads are necessary. The Applicant identified only one access gate and one access road coming from I-40. (Ex. 300, p. C.15-20.) But, based on the evidence, a secondary access road is required to ensure access to both the northern and southern solar fields, should the main access road with the above-grade crossing be blocked or otherwise unavailable. With implementation of Condition of Certification **WORKER SAFETY-6**, the project owner will provide secondary access gates and roads and means of access that are deemed acceptable by the SBCFD.

b. Emergency Response.

Staff produced evidence of SBCFD's emergency response over the past 12 years to the only three active solar power plants in the state: Solar Electric Generating Station (SEGS) 1 & 2 in Dagget, SEGS 3 – 7 at Kramer Junction, and SEGS 8 & 9 at Harper Dry Lake. In Staff's view, regardless of where a solar plant is located, the local fire department having jurisdiction will need to provide

some level of service in response areas that include fire response, hazmat spill response, rescue, and emergency medical services. (Ex. 300, pp. C.15-20 to C.15-22.) This data shows, however, that, excluding a major fire that occurred at SEGS 8 in 1990, SBCFD responded to about 30 incidents and emergences at the three solar facilities combined. Stated otherwise, the incident rate for all three power plants would be 30 in 12 years or 2.5 emergency calls per year or 0.83 emergencies per solar plant per year. (*Id*.)

Staff nonetheless concluded that the Calico Solar Project poses unique risks for fire response because it differs from the industrial, commercial, and residential development in the San Bernardino County desert region and from the existing solar plants located in the county. More particularly, the Calico plant will be larger in scale than the existing power plants and will produce, use, and store a large amount (34,000 pounds) of hydrogen gas. Staff opined that the use and storage of this amount of gas, combined with the remote location of the site and the potential for escalation of a small fire into a large conflagration enveloping the entire site and perhaps beyond, presents an emergency response challenge for SBCFD. Thus, according to Staff, the Calico Solar plant's unique needs and characteristics would pose significant added demands on local fire protection services and cause significant direct impacts on SBCFD. (Ex. 300, pp. C.15 -20 to C.15-24.)

We are not persuaded that the Calico Project will result in direct significant impacts to the physical environment or SBCFD's provision of a variety of emergency response services. Specifically with respect to EMS responses, the evidence shows that incidents at power plants requiring such response are infrequent and represent an insignificant impact on the local fire departments. (Ex. 300, p. C.15-22.) Yet there may be rare instances where a rural fire department with mostly volunteer fire-fighting staff may be insufficient to provide the required response. While the potential for both work-related and non-work related heart attacks exists at power plants, the evidence shows that many of the responses for cardiac emergencies involved non-work related incidences. (Ex. 300, pp. C.15-25 to C.15-26.) The evidence also shows that the quickest medical intervention would be achieved with the use of an on-site defibrillator often called an Automatic External Defibrillator or AED because the response from an off-site provider will take longer regardless of the provider location. Given the availability of modern, cost-effective AED devices, we adopt Staff-recommended Condition of Certification **WORKER SAFETY-5**, which requires the project owner to maintain a portable AED on site, and train workers in its proper use.

And, as further shown by the evidence discussed above, it is an event such as a major fire, and not routine plant operations, that cause concern for SBCFD. As is also shown by the evidence, the likelihood of such an occurrence is low. However, as discussed in the Cumulative Impacts section below, we find that that the project has potential to result in adverse cumulative impacts and that mitigation is required. (8/6/10 RT 193, 211-213, Ex. 300, p. C.15-22.)

4. Cumulative Impacts

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. (Cal. Code Regs., tit. 14, § 15130.)

Under CEQA, there are two acceptable and commonly used methodologies for establishing the cumulative impact setting or scenario: the “list approach” and the “projections approach”. The first approach would use a “list of past, present, and probable future projects producing related or cumulative impacts.” [14 Cal Code Regs §15130(b)(1)(A).] The second approach is to use a “summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact” [14 Cal Code Regs., § 15130(b)(1)(B)].

This evaluation uses the “list approach” for purposes of state law to provide a tangible understanding and context for analyzing the potential cumulative effects of a project. (Ex. 300, pp. B.3-2 to B.3-3.) Reasonably foreseeable future projects in the Newberry Springs/Ludlow area of San Bernardino County, including proposed nearby solar and wind projects are shown below in **Worker Safety and Fire Table 1**. (See also Ex. 300, § B.3.) These are reasonably foreseeable projects that may contribute to the cumulative effect because they are in the immediate vicinity of the Calico Solar Project site (i.e., within a 15-20 mile radius). (Ex. 300, pp. B.3-2 to B.3-2.)

Worker Safety and Fire Table 1
Future Foreseeable Projects in the Newberry Springs/Ludlow Area

ID	Project Name	Location	Agency/ Owner	Status	Project Description
A	SES Solar Three (CACA 47702)	T's. 8, 9N., R5E (Immediately west of project site)	SES Solar Three, LLC	BLM received completed amended application June 2007. SES withdrew the application for Solar Three in December 2009. As there was a second-in-line application, this application becomes the project proposed at this location. .	914 MW Stirling solar plant on 6,779-acre site.
B	Broadwell BrightSource (CACA 48875)	Broadwell Valley (T'8N and 9N; R7E) – in northeast direction of project site	Bright-Source Energy, Inc.	Application filed with BLM. Potential conflict with proposed National Monument. Plans withdrawn/put on hold in September 2009.	5,130-acre solar thermal facility using power tower technology.
C	SCE Pisgah Substation expansion	Immediately southeast of project site	Southern California Edison		Substation upgrade from 220-kV to 500-kV

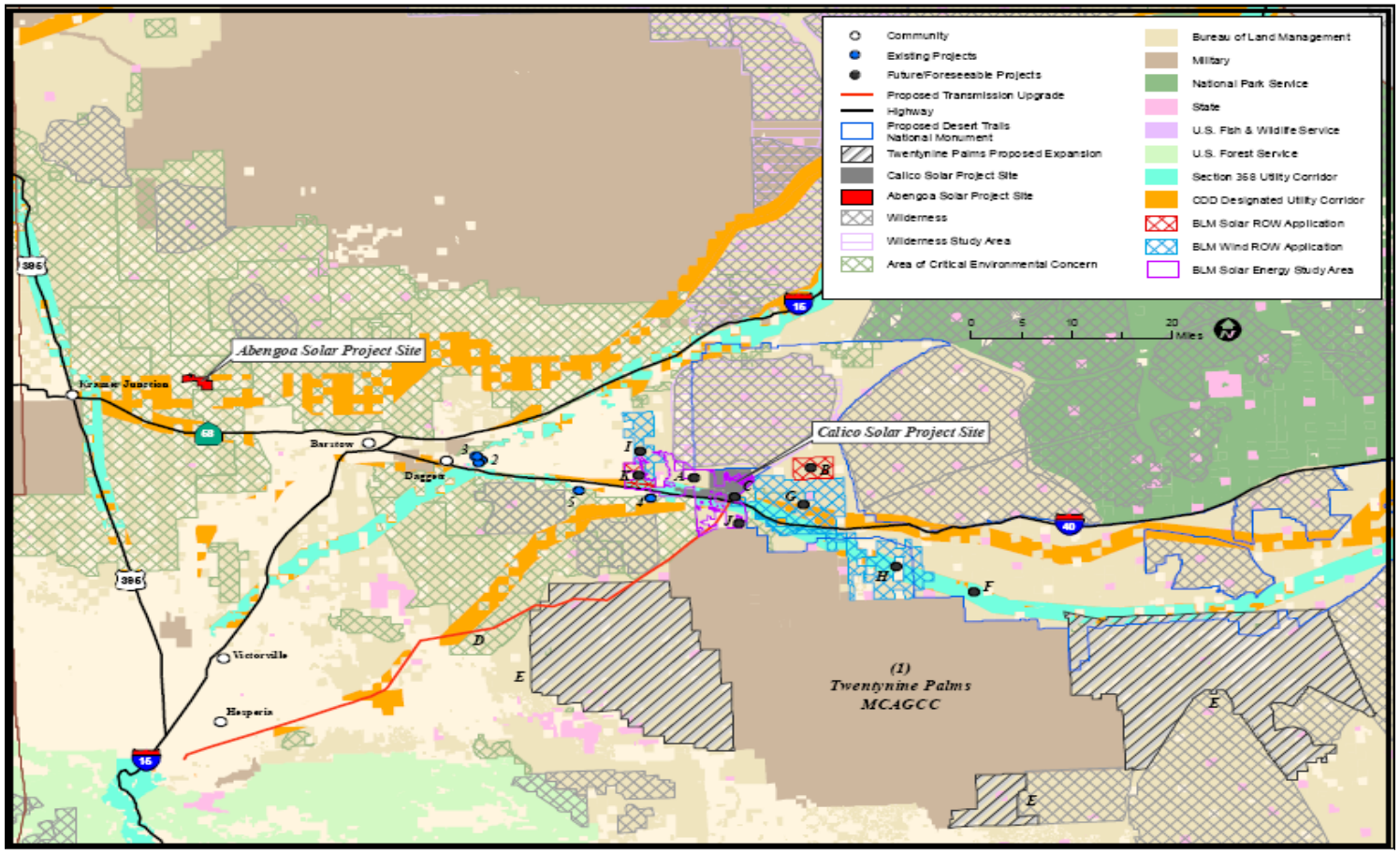
ID	Project Name	Location	Agency/ Owner	Status	Project Description
D	Pisgah-Lugo transmission upgrade	Pisgah Substation (SE side of project site) to Lugo Substation (near Hesperia)	Southern California Edison		The proposed 850 MW Calico Solar Project would require removal of 65 miles of existing 220-kV transmission line and reinstallation with a 500-kV line. The Reduced Acreage Alternative (275 MW) would require an upgrade of the telecommunication facilities serving the existing 200-kV Pisgah-Lugo transmission line. Specifically, it would require: • Replacement of a portion of existing Eldorado-Lugo 500-kV overhead ground wire with new optical ground wire between the Lugo and Pisgah Substations • Installation of a new fiber-optic line between the Pisgah Substation and Cool Water Substation (new fiber to be installed on approximately 20 miles of existing electric distribution poles).
E	Twentynine Palms Expansion	Morongo Basin (south of project site)	U.S. Marine Corps	NOI to prepare EIS to study alternatives published in Oct. 2009. Draft EIS expected September 2010.	400,000-acre expansion on the east, west, and south of the existing 596,000-acre Twentynine Palms Marine Corps base. In June 2009, approximately 60,000 acres in all study areas were removed from further study, leaving 360,000 acres under study (USMC 2009).

ID	Project Name	Location	Agency/ Owner	Status	Project Description
F	Solel, Inc. (CACA 049424)	Southwest of proposed site, immediately north of Twentynine Palms MCAGCC	Solel, Inc.	BLM received application in July 2007, POD is under review.	600 MW solar thermal plant proposed on 7,453 acres.
G	Wind project (CACA 48629)	Black Lava T2N, R5E, T1N, R5E	Oak Creek Energy	BLM received application December 2006. Issues with partial location in ACEC.	Wind project on 17,920 acres
H	Wind Project (CACA 48667)	South Ludlow T6N/R6E, T7N/R6E, T6N/R7E, T7N/R7E, T6N/R8E, T7N/R8E (In southeast direction of project site)	Oak Creek Energy	Pending	Wind project on 25,600 acres
I	Wind project (CACA 48472)	Troy Lake T9N&10N, R4E (In west direction of project site)	Power Partners SW (enXco)	Pending review of EA.	Wind project on 10,240 acres
J	Twin Mountain Rock Venture	10 miles west of Ludlow and 1 mile south of I-40; APN 0552-011-10-0000	Rinker Materials	Permit granted to extend permit to 2018	Plan to re-permit a cinder quarry on approximately 72 acres of leased land. No development activity has occurred on project site.
K	Solar thermal (CACA 49429)	Stedman (in southeast direction of project site)	Solel, Inc.	Application filed with BLM.	600 MW solar project on 14,080 acres. POD under review.

ID	Project Name	Location	Agency/ Owner	Status	Project Description
L	Proposed National Monument (former Catellus Lands)	Between Joshua Tree National Park and Mojave National Preserve		In December 2009, Sen. Feinstein introduced bill S.2921 that would designate 2 new national monuments including the Mojave Trails National Monument.	The proposed Mojave Trails National Monument would protect approximately 941,000 acres of federal land, including approximately 266,000 acres of the former railroad lands along historic Route 66. The BLM would be given the authority to conserve the monument lands and also to maintain existing recreational uses, including hunting, vehicular travel on open roads and trails, camping, horseback riding and rockhounding.
M	BLM Renewable Energy Study Areas	Along the I-10 corridor between Desert Center and Blythe	BLM	Proposed, under environmental review	The DOE and BLM identified 24 tracts of land as Solar Energy Study Areas in the BLM and DOE Solar PEIS. These areas have been identified for in-depth study of solar development and may be found appropriate for designation as solar energy zones in the future.

Source: Projects were identified through a variety of sources including the project AFC (Section 5.18) and Applicant's Submittal of CAISO Reports, SES 2010e and websites of the San Bernardino County Land Use Services Department, BLM, CEC and individual projects.

Worker Safety and Fire Figure 1
Cumulative Scenario



Source: Ex. 300, §B.3.

We find that the Calico Project differs from the existing industrial, commercial and residential development in the San Bernardino County desert region and existing solar plants, given its size and proposed production, use and storage of hydrogen. (Ex. 300, pp. C.15-22 to C.15-23.) The evidence further establishes that the Calico Project may exacerbate existing fire station drawdown and, in the event of a major detonation, may cause adverse physical and nonphysical impacts to SBCFD's ability to provide timely and adequate fire protection and emergency services. (8/6/10 RT 198; Ex. 300, pp. C.15-19 to C.15-24.)

Specifically with respect to the project's use of hydrogen, Asst. Chief Brierty indicated that this facility will use an innovative system with several tanks and pipes. (8/6/10 RT 176-177.) Even so, Asst Chief Brierty asserted that he did not believe that there is any real plausible potential of an explosion with hydrogen. Staff witness Alvin Greenberg also testified that the chances of a hydrogen explosion are remote. (8/6/10 RT 179.) But SBCFD is nonetheless concerned about the risk of fires, and the fires being close enough to the rail line or to some other combustible material, such as grass or other off-the site materials, that could cause a fire to escalate throughout the facility. (8/6/10 RT 177.)

Thus, based on the evidence, we find that the incremental impact of the Calico Project, together with the environmental changes anticipated from past, present and probable future projects, is cumulatively considerable with respect to fire and emergency services. We are persuaded by Staff's evidence (developed in consultation with SBCFD) that these impacts can be fully mitigated to less than significant levels if the Calico Project funds its proportionate share of SBCFD mitigation activities. At some future time there may be need for SBCFD to construct additional fire infrastructure or improve existing fire stations, related fire equipment and staff, or related alternative mitigation measures. (Exs. 300, pp. C.15-24 to C.15-25; 302.)

Staff specifically concludes that impacts attributable to the Calico Project will be mitigated with the project's payment to SBCFD of $1,187,000 for capital improvements and annual payments of $1,095,000 for the life of the project. (Exs. 300, p. C.15-25; 302.) In contrast, the Applicant maintains that any payment for impacts should not exceed $62,000 per year. (8/6/10 RT 143.) While both parties provided documentary evidence and testimony to support their positions, neither party provided clear evidence that the assumptions and methodologies underlying the respective funding recommendations adequately focused on the Calico Project's reasonable and proportionate contribution to the identified cumulatively considerable impacts.

Staff's methodologies and conclusions may require mitigation from the project in excess of its impacts, while the Applicant's methodology and conclusions may result in the project not providing its share of mitigation. For instance, the risk matrix relied on by Staff and SBCFD appears to give little or no weight to Staff's evidence establishing that the combined incident rate for the SEGS VIII, IX, and Kramer Junction solar facilities was 30 over a period of 12 years, which was merely 2.5 emergency calls per year or 0.83 emergencies per solar plant per year. (Ex. 300, pp. C.15-20 to C.15-22.) This evidence suggests that the analysis proposed by Staff and SBCFD for the Calico Project's cost allocation did not properly consider the historical risks posed by solar facilities in San Bernardino County.

The Applicant's evidence suggests that under a worst case and unlikely scenario a hydrogen-related conflagration would have an impact radius that does not exceed 0.3 miles from the center of the explosion. (8/6/10 RT 135-136, 144.) Moreover, because the 850 MW project would operate in 9 MW units, with each SunCatcher connected to valves that would shut off with pressure changes, the project's potential impacts to fire and emergency services should result in the project being viewed as a 9 MW project and not an 850 MW project. (8/6/10 RT 142-143, 166- 167.) However, this approach is overly simplistic and does not adequately represent the potential for fire risk of the entire project.

The evidence submitted by intervenor Newberry Community Service District underscores the need for further risk analysis and consideration of the project's appropriate mitigation funding. According to District Chief Springer, no consideration was given to impacts on the outlying areas working in cooperation with San Bernardino County to meet their response and mitigation factors. If there is a major event at the Calico site, Chief Springer anticipates receiving a request to provide and providing support to SBCFD. The Chief stated this would put a significant drain on resources in the District's area for coverage, but, according to Chief Springer, is not addressed by the analyses presented. (8/6/10 RT 212-214.)

Based on the significant and irreconcilable disparities in the assumptions underlying the proffered methodologies and mitigation funding amounts, we find that further study is required to more precisely quantify the project's impacts and set the corresponding funding level with the identified mitigation activities to be undertaken by SBCFD. As a result, we have adopted Condition of Certification **WORKER SAFETY-7**, which requires the project owner and SBCFD to agree upon a funding amount and payment terms to ensure that the identified mitigation

can provide adequate fire protection and emergency response as discussed above. If agreement cannot be reached, the Condition requires preparation of a study by an independent consultant subject to the specified protocols and requirements. Plant operation shall not occur until the requirements of **WORKER SAFETY-7** are satisfied.

If the requirements of Condition of Certification **WORKER SAFETY-7** are not satisfied by the time the project owner, in consultation with the CPM, determines that construction must commence, Condition of Certification **WORKER SAFETY-8** allows the project owner to engage in construction activities upon making pre-construction mitigation payments to SBCFD based on the project's proposed two-phase development. Phase 1 comprises approximately 1,876 acres and Phase 2 comprises 2,737 acres. Phase 1 will be further broken down into Phase 1a and Phase 1b. Phase 1a includes 250 acres of the project site and linear elements, and involves (i) construction of the main access road, the waterline, the Main Services Area, the substation area, (ii) installation of 60 SunCatcher pedestals, and (iii) the temporary at-grade crossing and the permanent bridge spanning the Burlington Northern Santa Fe (BNSF) railroad tracks. All other aspects of Phase 1 will be completed in Phase 1b.

The mitigation payments set forth in **WORKER SAFETY-8** shall be made as follows: (a) $91,750 (250 acres x $367 per acre) prior to the start of construction for Phase 1a; (b) $596,742 (1,626 acres x $367 per acre) prior to the start of construction for Phase 1b; and (c) $1,004,479 (2,737 acres x $367 per acre) prior to the start of construction for Phase 2. These payment amounts were negotiated and agreed upon by and among the Applicant, Staff, and SBCFD as adequate pre-construction mitigation. (8/25/10 RT 294-297.) We have adjusted them for the reduced footprint of Scenario 5.5 and invite the parties to comment. This funding shall off-set any initial funding required by **WORKER SAFETY-7** above until the funds are exhausted.

5. Public and Agency Comment

Staff received comments from the Applicant and Intervenor Patrick Jackson. Staff's responses to and our consideration of these comments are reflected in the record (Ex. 300, p. C.15-35) and as, appropriate, incorporated into the discussion above and elsewhere within this Decision (See, e.g., Conditions of Certification **HAZ-7** and **WORKER SAFETY-2**, **WORKER SAFETY-7**, and **WORKER SAFETY-8**).

Neither the public nor public agencies submitted comments.

FINDINGS OF FACT

Based on the evidence, the Commission makes the following findings:

1. Industrial workers are exposed to health and safety hazards on a daily basis.

2. To protect workers from job-related injuries and illnesses, the project owner will implement comprehensive Safety and Health Programs for both the construction and the operation phases of the project.

3. The project will employ an on-site professional Safety Monitor during construction and operation.

4. The Conditions of Certification ensure that workers are properly protected from work-related hazards at the site.

5. The Calico Solar Project will include on-site fire protection and suppression systems as the first line of defense in the event of a fire.

6. If required, the San Bernardino County Fire Department will provide fire protection and emergency response services to the project.

7. The project will not have a significant direct or indirect impact on fire protection and emergency services; however, it may result in significant cumulative impacts. Implementation of the Conditions of Certification below will reduce any potential project impacts to fire protection and emergency service to less than significant levels.

8. With implementation of the Conditions of Certification, below, the Calico Solar Project will comply with all applicable LORS.

CONCLUSION OF LAW

1. We therefore conclude that with implementation of the Conditions of Certification, the Calico Solar project will not create significant health and safety impacts to workers, and will comply with all applicable laws, ordinances, regulations, and standards listed in the appropriate portion of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

WORKER SAFETY-1 The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Injury and Illness Prevention Program;
- A Construction heat stress protection plan that implements and expands on existing Cal OSHA regulations as found in 8 CCR 3395;
- A Construction Emergency Action Plan; and
- A Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring, the Personal Protective Equipment Program, the Exposure Monitoring Program, the Heat Stress Protection Plan, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval of compliance of the program with all applicable safety orders. These plans shall include programs to prevent exposure of workers to the unusual hazard of high intensity reflected light from the solar parabolic mirrors. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the San Bernardino County Fire Department for review and comment prior to submittal to the CPM for approval.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the San Bernardino County Fire Department with the fire department's comments on the Construction Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan;
- An Operation heat stress protection plan that implements and expands on existing Cal OSHA regulations (8 CCR 3395);
- A Best Management Practices (BMP) for the storage and application of herbicides;
- An Emergency Action Plan;

- Hazardous Materials Management Program;
- Fire Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, the Heat Stress Protection Plan, BMP for Herbicides, and Personal Protective Equipment Program shall be submitted to the CPM for review and approval concerning compliance of the programs with all applicable safety orders. These plans shall include programs to prevent exposure of workers to the unusual hazard of high intensity reflected light from the solar parabolic mirrors. The Fire Prevention Plan and the Emergency Action Plan shall address special precautions and responses to implement when a fire involves a SunCatcher or hydrogen piping located within 200 feet of a fence line where a public access road exists directly on the other side of the fence. The Fire Prevention Plan and Emergency Action Plan shall also be submitted to the San Bernardino County Fire Department and the BNSF railroad for review and comment.

Verification: At least 30 days prior to the start of operations, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA and federal regulations related to power plant projects;
- Assure that all construction and commissioning workers and supervisors receive adequate safety training;
- Complete accident and safety-related incident investigations, emergency response reports for injuries, and inform the CPM of safety-related incidents; and
- Assure that all the plans identified in **Worker Safety-1** and **2** are implemented.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the CSS. The contact information of any replacement CSS shall be submitted to the CPM within one business day.

The CSS shall submit in the Annual Compliance Report documentation of monthly safety inspection reports to include:

- Record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- Summary report of safety management actions and safety-related incidents that occurred during the month;
- Report of any continuing or unresolved situations and incidents that may pose danger to life or health; and
- Report of accidents and injuries that occurred during the month.

WORKER SAFETY-4 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO, and will be responsible for verifying that the Construction Safety Supervisor, as required in **Worker Safety-3**, implements all appropriate Cal/OSHA and Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: At least 30 days prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that two or more portable automatic external defibrillators (AEDs) are located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During construction and commissioning, the following persons shall be trained in its use and shall be on-site whenever the workers that they supervise are on-site: the Construction Project Manager or delegate, the Construction Safety Supervisor or delegate, and all shift foremen. During operations, all power plant employees shall be trained in its use. The training program shall be submitted to BLM's authorized officer and the CPM for review and approval.

Verification: At least 30 days prior to the start of site mobilization the project owner shall submit to BLM's authorized officer and the CPM proof that a portable AED exists on site and a copy of the training and maintenance program for review and approval.

WORKER SAFETY-6 Prior to the start of site mobilization for Phase 1b, the project owner shall:

a. Provide secondary access gates for emergency personnel to enter the southern and northern portions of the site. These secondary access gates shall be at least one-quarter mile from the primary access points and may be restricted to emergency response personnel.

b. Provide a second access road or roads that serve both the northern portion of the site and the southern portion of the site. This road(s) shall be treated with Soiltac or its equivalent with 80 percent compaction, at least 20 feet wide. The secondary emergency access road may cross the BNSF tracks at an at-grade crossing.

c. Maintain the main access road and the secondary access roads and provide a plan for implementation.

d. Provide funding for a gate (with a lock allowing emergency response access), posting to direct emergency responders to notify BNSF operations before crossing, telephone box to allow BNSF notification at the at-grade crossing of the BNSF rail line on the secondary access road, and any road improvements required by the San Bernardino County Fire Department.

e. Provide an at-grade crossing of the BNSF tracks between the southern and northern portions of the site and provide funding for a gate (with a lock allowing emergency response access), posting to direct emergency responders to notify BNSF, a telephone box to allow for notification to BNSF by emergency responders when using the secondary access road, and any road improvements near the crossing recommended by the SBCFD.

Plans for the secondary access gates, the method of gate operation, secondary emergency access road(s), the above-grade crossing, and to maintain the roads shall be submitted to the San Bernardino County Fire Department for review and comment and to the CPM for review and approval.

Verification: At least 30 days prior to the start of site mobilization for Phase 1b, the project owner shall submit to the San Bernardino County Fire Department and the CPM preliminary plans showing the location and dimensions of the secondary access gates to both the southern and northern portions of the site, a description of how the gates will be opened by the fire department, and a description and map showing the location, dimensions, and composition of the main road, location of the secondary emergency access road(s) to the southern

and northern portions of the site, and the engineering drawings and precise location of the above-grade crossing structure.

At least 30 days prior to the start of site mobilization, the project owner shall submit final plans plus the road maintenance plan to the CPM review and approval. The final plan submittal shall also include a letter containing comments from the San Bernardino County Fire Department or a statement that no comments were received.

WORKER SAFETY-7 The project owner shall either:

(1) Reach an agreement with the San Bernardino County Fire Department (SBCFD) regarding funding of its project-related share of capital and operating costs to build and operate new fire protection/response infrastructure and provide appropriate equipment as mitigation of project-related impacts on fire protection services within the jurisdiction.

or

(2) The project owner shall fund a Fire Needs Assessment and Risk Assessment conducted by an independent contractor who shall be selected by the project owner and approved by the CEC Compliance Project Manager (CPM) and fulfill all mitigation identified in the independent fire needs assessment and a risk assessment. The Fire Needs Assessment must address emergency response and equipment, staffing, and location needs while the Risk Assessment must be used to establish the risk (chances) of significant impacts occurring.

Should the Applicant pursue option (2), above, the Fire Needs Assessment and Risk Assessment shall evaluate the following:

(a) The risk of impact on the local population that could result from potential unmitigated impacts on local fire protection and emergency services (i.e. “drawdown” of emergency response resources);

(b) The extent that the project’s exemption from local taxes will impact local fire protection and emergency response services; and

(c) Recommend an amount of funding that should be provided to mitigate any identified significant impacts on local fire protection and emergency response services.

Compliance Protocols for the Fire Needs Assessment and Risk Assessment shall be as follows:

(a) The study shall be conducted by an independent consultant approved by the CPM. The project owner shall provide the CPM with the names of at least three consultants, whether entities or individuals, from which to make a selection, together with statements of qualifications. The CPM shall approve one of the three proffered consultants;

(b) The Fire Needs Assessment and Risk Assessment shall be fully funded by the project owner. The independent consultant(s) preparing the Fire Needs Assessment and Risk Assessment shall work directly for the Energy Commission;

(c) The project owner shall provide the protocols for conducting the independent fire needs assessment for review and comment by the SBCFD and review and approval by the CPM prior to the independent consultant's commencement of the fire needs assessment;

(d) The CPM shall be copied in any correspondence including emails or letters and included in any conversations between the project owner and consultant; and

(e) The CPM shall verify that the Fire Needs Assessment and Risk Assessment are prepared consistent with the approved fire needs assessment protocols and a risk assessment protocols.

Plant operation shall not occur until funding of mitigation occurs either (i) pursuant to an agreement reached between the project owner and the SBCFD, or (ii) pursuant to the independent Fire Needs and Risk Assessments conducted by an independent consultant approved by the CPM or (iii) as determined by the Energy Commission or its designee if the project owner and SBCFD do not agree to the recommendations of the independent consultant's study. The Energy Commission or its designee shall, based on the results of the study and comments from the project owner and SBCFD, make the final determination regarding the funding to be provided to the SBCFD to accomplish the above-identified mitigation.

Verification: If Option 1 of Condition of Certification **WORKER SAFETY-7** is fulfilled prior to plant operation, then the project owner shall provide to the CPM a copy of the individual agreement with the SBCFD. If option 2 of Condition of Certification **WORKER SAFETY-7** is selected, then prior to plant operation the project owner shall provide to the CPM a protocol, scope and schedule of work for the independent Fire Needs Assessment and Risk Assessment and the qualifications of proposed contractor(s) for review and approval by the CPM; a copy of the completed Fire Needs Assessment and Risk Assessment showing the precise amount the project owner shall pay for mitigation; and documentation

that the amount has been paid. If the Energy Commission or its designee establishes the payment amount, then prior to plant operation, the project owner shall provide the CPM with a copy of the order or decision and documentation establishing that the amount has been paid

Annually thereafter, the owner shall provide the CPM with verification of funding to the San Bernardino County Fire Department for required fire protection services mitigation pursuant to the agreement with the Fire Department or the CPM approved independent fire needs assessment.

WORKER SAFETY-8 In the event that the project owner has not satisfied the conditions set forth in **WORKER SAFETY-7** by the time the project owner, in consultation with the CPM, determines construction must commence, the project owner shall pay to SBCFD (a) $91,750 (250 acres x $367 per acre) prior to the start of construction for Phase 1a; (b) $762,259 (2,077 acres x $367 per acre) prior to the start of construction for Phase 1b; and (c) $1,426,896 (3,888 acres x $367 per acre) prior to the start of construction for Phase 2. This funding shall off-set any initial funding required by **WORKER SAFETY-7** above until the funds are exhausted. This offset will be based on a full accounting by the SBCFD regarding the use of these funds.

Verification: At least 10 days prior to the start of site mobilization for Phase 1a, 1b and Phase 2, respectively, the project owner shall provide to the CEC CPM either:

a. documentation that the payment described above has been made;

or

b. that payment has been made pursuant to a contractual agreement with the SBCFD.

The CEC CPM shall adjust any payments initially required by **WORKER SAFETY-7** based upon the accounting provided by the SBCFD.

WORKER SAFETY-9 The project owner shall develop and implement an enhanced Dust Control Plan that includes the requirements described in **AQ-SC3** and additionally requires:

i. site worker use of dust masks (NIOSH N-95 or better) whenever visible dust is present;

ii. implementation of methods equivalent to Rule 402 of the Kern County Air Pollution Control District (as amended Nov. 3, 2004); and

iii. implementation of enhanced dust control methods (increased frequency of watering, use of dust suppression chemicals, etc. consistent with **AQ-SC4** immediately whenever visible dust comes from or onto the site or when PM10 measurements obtained when implementing ii (above) exceed 50 $\mu g/m^3$.

Verification: At least 30 days prior to the commencement of site mobilization, the enhanced Dust control Plan shall be provided to the CPM for review and approval.

E. HAZARDOUS MATERIALS MANAGEMENT

This analysis considers whether the construction and operation of the Calico Solar Project will create significant impacts to public health and safety resulting from the use, handling, transportation, or storage of hazardous materials. This analysis does not address the potential exposure of workers to hazardous materials used at the project site; the **Worker Safety and Fire Protection** section of this Decision addresses this issue. Several site-specific factors affect the potential for project-related hazardous materials to cause adverse impacts. These include meteorological conditions, terrain characteristics, and the proximity of population centers and sensitive receptors relative to the project. In addition, sensitive subgroups such as the young, elderly, and those with existing conditions may be at greater risk from exposure to emitted pollutants. (Ex. 300, pp. C.5-1 to C.5-6.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Potential Risks

The method used to assess risks posed by hazardous materials includes the following elements:

- A review of chemicals, the amounts proposed for on-site use, and a determination of the need and appropriateness of their use.

- Chemicals which will be used in small amounts, or whose physical state is such that there is virtually no chance that a spill will migrate off the site and impact the public, were removed from further consideration.

- Measures proposed to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings, as well as administrative controls such as worker training and safety management programs.

- Measures proposed to respond to accidents were reviewed and evaluated. These measures included engineering controls such as catchment basins and methods to keep vapors from spreading, as well as administrative controls such as training emergency response crews.

- An analysis of the theoretical impacts on the public of a worst-case spill of hazardous materials even with the mitigation measures in place. (Ex. 300, pp. C.5-6 to C.5-7.)

a. Small Quantity Hazardous Materials

Hazardous materials used during construction will include paint, cleaners, solvents, gasoline, diesel fuel, motor oil, welding gases, and lubricants. Any impact of spills or other releases of these materials would be limited to the site because of the small quantities involved, the infrequent use and hence reduced chances of release, and/or the temporary containment berms used by contractors. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel all have very low volatility and would represent limited off-site hazards, even in larger quantities. (Ex. 300, p. C.5-7.)

During operations, hazardous chemicals such as cleaning agents, lube oil, sodium hydroxide, diesel fuel, gasoline, ethylene glycol, and other various chemicals will be used and stored on-site and represent limited off-site hazard due to their small quantities, low volatility, and/or low toxicity. (Ex. 300, p. C.5-7.)

Hazardous Materials **Appendix A** (incorporated in Condition of Certification **HAZ-1** at the end of this section) lists the hazardous materials that will be used and stored on-site. Condition **HAZ-1** prohibits the project owner from using hazardous materials not listed in **Appendix A**, or storing them in greater quantities than specified, without prior approval of the Energy Commission's Compliance Project Manager

b. Large Quantity Hazardous Materials

Hydrogen is used as the working fluid in the Stirling cycle engines utilized by the project. Hydrogen will be produced onsite, and distributed through pipes or by truck in k-bottles to each SunCatcher engine. The Applicant is evaluating both methods for providing hydrogen to the SunCatchers.

From experience gained at other solar facilities, the Applicant has changed its original proposal for a hydrogen system and has increased the maximum amount of hydrogen stored at each SunCatcher from 3.4 to 11 standard cubic feet (scf), which would accommodate two full charges of the power conversion unit. For both systems, the hydrogen would be generated by electrolysis using two generators, each producing 1,820 scf per hour. Both systems would store up to 36,400 standard cubic feet in one tank. The currently proposed centralized hydrogen system would distribute hydrogen from the central storage tank to 95 compressor groups and from there to each SunCatcher using piping. Each compressor group would include a 29,333-scf high pressure supply tank and a

9,900-scf low pressure dump tank. Hydrogen refilling of each SunCatcher supply tank is expected to occur about three times per year. It would bring the on-site hydrogen to over 20,000,000 scf. (Ex. 300, p. C.5-8.)

Hazardous Materials Management Table 1, below, provides a comparison of the proposed hydrogen systems.

HAZARDOUS MATERIALS MANAGEMENT TABLE 1
COMPARISON OF PROPOSED HYDROGEN SYSTEMS

Feature	Centralized Hydrogen System	Distributed Hydrogen System
Storage - main service complex	36,400 x 1 tank	36,400 scf x 1 tank
High-pressure supply tank	29,333 x 95 compressor groups	82 scf x 34, 000 SunCatchers
Low-pressure supply tank	9,900 scf x 95 compressor groups	28 scf x 34,000 SunCatchers
Local storage tank	---	489 scf x 34, 000 SunCatchers
Single SunCatcher	11 scf	11 scf
Distribution method	pipeline	truck
Total amount onsite	4,140,00 scf (23, 000 lbs)	20,800,000 scf (116,000 lbs)

(Ex. 56, Supplement to AFC, p. 1-6, Table 1-1.)

The Applicant conducted an analysis assuming a worst-case release of all the hydrogen on site. It was assumed that a hydrogen release would form a vapor cloud and detonate causing an unconfined vapor cloud explosion. The distance to an over pressure of 1.0 psi was then determined. This is an over pressure that could cause some damage to structures and injury to exposed members of the general population. Four different scenarios were evaluated for the centralized system and three different scenarios for the distributed system. (Ex. 300, p. C.5-8.)

Phase II of the project would place SunCatchers and their stored hydrogen on land only a few hundred feet from traffic in I-40 and within one fourth-mile of the residence located to the south of I-40. This would result in traffic on I-40 and the residence being located within the 0.54 mile of the worst-case overpressure zone, thus indicating a potential for blast effects on traffic and the residence.

It is nearly impossible to detonate hydrogen in an unconfined vapor cloud because it disperses very rapidly due to its low density relative to air. The

evidence establishes that the Applicant's analysis was conservative and overestimated the magnitude of the potential risk of any actual explosion that could occur at the facility. The assessment assumed an instantaneous release of the entire volume of hydrogen instead of a more realistic release occurring over a period of time resulting in a significant dispersion of the hydrogen while the cloud was forming. Actual hydrogen releases have not resulted in unconfined cloud explosions. It is widely believed that unconfined hydrogen will not detonate without a high explosive initiating event. (Ex. 300, C.5-9.)

We conclude that an unconfined hydrogen vapor cloud detonation is not plausible and would not occur at the facility, and that the use of hydrogen posed some on-site explosion risk but no significant risk to the surrounding area. However, fires at the Calico Solar Project site could impact traffic on I-40 and the nearest residence from the extreme heat and the potential escalation of the fire beyond site boundaries, The BNSF railroad bisects the project site; a derailment could pose a risk to the site. Therefore, we adopt Conditions of Certification **HAZ-2, HAZ-7**, and **HAZ-8** to reduce potential impacts associated with the use of hydrogen for the Calico Solar Project. Condition of Certification **HAZ-2** will require Risk Management Plan that will include an Offsite Consequence Analysis. In addition, Conditions of Certification **HAZ-7** will require that the hydrogen system – whichever system the Applicant decides to use – is designed to applicable engineering safety codes and Condition of Certification **HAZ-8** requires a hazard analysis conducted by an independent third party.. We find that with implementation of these Conditions of Certification the project will not pose a significant risk to the public. (Ex. 300, pp. C.5.1, C.5-8, and C.5-9.)

2. Risk Mitigation

The evidence supports the implementation of specific mitigation measures to ensure that no significant risk will result from the use of hazardous materials. A Safety Management Program will reduce the potential for accidents resulting in the release of hazardous materials. This program would include both engineering and administrative controls to help prevent accidents and releases (spills) from moving off-site and impacting the community. Elements of the plan are summarized below.

- Engineering Controls. The Applicant has proposed use of secondary containment in storage areas and physical separation of stored chemicals to prevent accidental mixing of incompatible materials.

- Administrative Controls. The **Worker Safety** and **Fire Protection** section of this Decision requires a Worker Health and Safety Program that

> addresses administrative controls at the proposed project. This would include worker training on chemical hazards, personal protective equipment safety operating procedures; fire safety and prevention; and emergency response actions. (Ex. 300, p. C.5-11.)

We adopt Conditions of Certification **HAZ-1, HAZ-2,** and **HAZ-3** to address the management of hazardous materials for the Calico Solar Project. Condition of Certification **HAZ-1** requires that only approved hazardous materials be used at the facility as listed in the application. Condition of Certification **HAZ-2** requires the preparation and approval of a Hazardous Materials Business Plan, a Risk Management Plan, and a Spill Prevention, Control, and Countermeasures Plan that will incorporate state requirements for the handling of hazardous materials. Condition of Certification **HAZ-3** requires the preparation of a Safety Management Plan for project construction and operation. (Ex. 300, p. C.5-12.)

The evidence indicates that a San Bernardino County Fire Department (SBCFD) hazmat response team is located at Station #322 in Adelanto, about a one-hour drive from the project site. In the event of a large incident involving hazardous materials, this station would provide backup support. This hazmat response unit is capable of handling any incident at the proposed Calico Solar Project. (Ex. 300, p. C.5-12 and C.5-13.)

In order to address spill response, the project owner will prepare and implement an emergency response plan that includes information on hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, prevention equipment and capabilities, etc. Emergency procedures will be established which include evacuation, spill cleanup, hazard prevention, and emergency response. We find that, given the remote location, the hazardous material response time is acceptable, and that the SBCFD is adequately trained and equipped to respond to a hazardous materials spill emergency at Calico Solar in a timely manner. (Ex. 300, p. C.5-12.)

3. Transportation Risk Reduction

The evidence shows that containerized hazardous materials will be transported to the facility via truck. During construction and operation of the Calico Solar Project, the transport of minimal amounts and types of hazardous materials will not pose a significant risk of either spills or impacts along any transportation route. Therefore, we find that no specific transportation route needs to be identified for this project. (Ex. 300, p. C.5-13.)

Liquid hazardous materials can be released during a transportation accident, and the extent of their impact in the event of a release will depend on the location of the accident and the rate of vapor dispersion from the surface of the spilled pool. The evidence includes evaluation of the risk of accident and release during the transportation of hazardous materials. The evidence establishes, and we find, that the transport on I-40 and then for a short distance from I-40 on a dedicated road in a remote area, will present a less than significant risk of accident and release. (Ex. 300, p. C.5-13.)

4. Seismic Issues

The evidence presents the possibility of an earthquake causing the failure of a hazardous materials storage tank, secondary containment systems, and electrically controlled valves and pumps. The failure of all these preventive control measures might then result in the release of hazardous materials that could move offsite and impact the surrounding areas. (Ex. 300, p. C.5-13.)

The evidence indicates that after the January 1994 Northridge earthquake some damage was caused to several large and small storage tanks at the water treatment system of a cogeneration facility. The tanks with the greatest damage, including seam leakage, were older tanks, while newer tanks sustained less damage with displacements and attached line failures. Similar analysis of the February 2001 Nisqually earthquake near Olympia, Washington, showed no hazardous materials storage tanks were impacted by this quake. The assessment also considered the recent earthquakes in Haiti and Chile and found no evidence of impact on hazardous materials storage and pipelines. (Ex. 300, C.5-14.) The Calico Solar Project will be designed and constructed to the applicable standards of the 2007 California Building Code for Seismic Zone 4. On the basis of damage experienced from the Northridge quake to older tanks and the lack of failures during the Nisqually earthquake with newer tanks, the evidence discloses, and we find, that tank failures during seismic events are not likely and do not represent a significant risk to the public. (Ex. 300, pp. C.5-13 to C.5-14.)

5. Site Security

The Calico Solar Project proposes to use hazardous materials that necessitate special site security measures to prevent unauthorized access. The evidence indicates that the U.S. Department of Homeland Security (DHS) published an interim Final Rule to require facilities that use or store certain hazardous

materials to conduct vulnerability assessments and implement certain specified security measures. The rule lists hydrogen as a Chemical of Interest with a threshold level of 10,000 lbs. The Calico Solar Project will have a maximum of 37,243 lbs of hydrogen on-site and therefore the rule will apply. The project owner will need to submit a "Top Screen" assessment to the DHS consistent with the Chemical Facility Anti-Terrorism Standard (CFATS). (Ex. 300, pp. C.5-3 and C.5-14.)

In order to ensure that this facility (or a shipment of hazardous material) is not the target of unauthorized access, we adopt Conditions of Certification **HAZ-4** and **HAZ-5** to address both construction security and operations security plans. These plans would require the implementation of site security measures that are consistent with the North American Electric Reliability Corporation (NERC) *Security Guidelines for the Electricity Sector* in 2002 (NERC 2002), NERC Critical Infrastructure Protection standard for cyber security, the U.S. Department of Energy draft *Vulnerability Assessment Methodology for Electric Power Infrastructure* in 2002 (DOE 2002), and Energy Commission guidelines. (Ex. 300, p. C.5-14.)

Additional security measures include perimeter fencing and breach detectors, guards, alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contact in the event of a security breach. Site access for vendors will be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials vendors will have to maintain their transport vehicle fleets and employ only drivers who are properly licensed and trained. The project owner will be required, through its contractual language with vendors, to ensure that vendors supplying hazardous materials strictly adhere to the U.S. DOT requirements regarding security plans (49 CFR 172.802), and ensure that all hazardous materials drivers are in compliance with personnel background security checks (49 CFR Part 1572, Subparts A and B). (Ex. 300, pp. C.5-14 to C.5-15.)

6. Cumulative Risks

The geographic area considered for cumulative impacts from the use of Hazardous Materials is the area within one mile of the project boundary. The record contains analysis of the potential for impacts due to a simultaneous release of any of the hazardous chemicals from the Calico Solar Project with any other nearby facilities. The Calico Solar Project would not be expected to

contribute to the possible short-term, long-term, or decommissioning cumulative impacts related to hazardous materials. The project will not be located in close proximity to any other facility that might impact the same surrounding population in the event of an accidental release of hazardous materials. Based on the evidence that there are no nearby facilities using large amounts of hazardous chemicals, we find there is minimal possibility for cumulative hazardous materials impacts. (Ex. 300, pp. C.5-22 to C.5-23.)

7. Compliance with Laws, Ordinances, Regulations and Standards (LORS)

A listing of Federal, State and Local LORS applicable to the proposed project is set forth at Ex. 300, p. C.5-2. The evidence shows, and the Conditions of Certification we have adopted herein require, that the project owner comply with all applicable LORS.

8. Public and Agency Comments

Three comments were submitted regarding the Calico Solar Project's use of hazardous materials. Comments and responses are summarized below.

- Patrick C. Jackson, intervener, commented on the proposed project's impact on safety in the surrounding project area especially the use of hydrogen Staff evaluated the Applicant's Off-site Consequence Analysis and determined that there will be no significant risk to nearby populations as a result of the project.

- The Applicant commented that background checks for 700 construction personnel as required in **HAZ-5** would be onerous. The record indicates that the requirement applies only to operations personnel and not construction personnel.

- The BSNF Railway expressed concern that hydrogen gas in an underground piping system would be vulnerable to leaks and damage in the event of a train derailment. The record indicates that Staff included additional analysis of hydrogen use on the project site in the Supplemental Staff Assessment and identified Conditions of Certification **HAZ-7** and **HAZ-8** to address concerns from the BNSF railroad. **HAZ-7** requires that the hydrogen system be designed consistent with applicable design codes and **HAZ-8** requires an outside third party review of the system. Also, **HAZ-2** requires an Off-Site Consequence Analysis be included in the Risk Management Plan if hydrogen will be distributed by pipeline (Centralized Hydrogen System).

FINDINGS OF FACT

Based on the uncontroverted evidence of record, the Commission makes the following findings and conclusions:

1. The Calico Solar Project will use hazardous materials during construction and operation, including hydrogen.

2. The major public health and safety dangers associated with these hazardous materials include the accidental release, fire, and potential explosion from hydrogen gas.

3. The risk of explosion from hydrogen gas will be reduced to insignificant levels through adherence to applicable codes, and the implementation of effective safety management practices, and Conditions of Certification.

4. The project owner will submit an approved Safety Management Plan for handling all hazardous materials and an approved Hazardous Materials Business Plan prior to delivery of any hazardous materials to the site.

5. Hydrogen poses a fire risk but the evidence indicates that Conditions of Certification **HAZ-2**, **HAZ-7**, and **HAZ-8** will reduce the potential for fire to escalate beyond the site boundaries. .
6. The record includes the evaluation of two options for distribution of hydrogen gas for the Calico Solar Project. Hydrogen gas will be produced on site and will be distributed either through a closed-cycle system (pipes) to the SunCatchers engines or by truck as determined by the Applicant.

7. The existing design of the Calico Solar Project is sufficient to safeguard against off-site migration of hazardous materials, including berms, secondary containment, and separate containment of hazardous materials.

8. Condition of Certification **HAZ-3** reduces the potential for accidents resulting in the release of hazardous materials by the implementation of a Safety Management Program.

9. The San Bernardino County HazMat Team is adequately trained and equipped to provide backup support if an emergency were to occur at the Calico Solar facility.

10. Other hazardous substances used on-site will be used in small quantities, have low volatility, and/or are of low toxicity.

11. Tank failures during seismic events are not likely and do not represent a significant risk to the public.

12. Conditions of Certification **HAZ-4** and **HAZ-5** require both construction and operational site security measures that include perimeter security, written procedures, monitoring, and other measures to control site access and prevent malicious mischief, vandalism, and terrorist attacks.

13. With implementation of the Conditions of Certification, below, the Calico Solar Project will comply with all applicable laws, ordinances, regulations, and standards related to hazardous materials management as identified in the evidentiary record and in the pertinent portion of **Appendix A** of this Decision.

CONCLUSION OF LAW

1. The Commission concludes, therefore, that the use of hazardous materials by the Calico Solar Project will not result in any significant adverse public health and safety impacts.

CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous materials not listed in **Appendix A**, below, or in greater quantities than those identified by chemical name in **Appendix A,** unless approved in advance by the Compliance Project Manager (CPM).

Verification: The project owner shall provide to the CPM in the Annual Compliance Report, a list of hazardous materials contained at the facility.

HAZ-2 The project owner shall concurrently provide a Hazardous Materials Business Plan (HMBP), a Risk Management Plan (RMP) that includes the consequences of a train derailment resulting in a hydrogen pipeline leak and fire, and a Spill Prevention, Control, and Countermeasure Plan (SPCC) to the San Bernardino County Fire Department, and the CPM for review. After receiving comments from the San Bernardino County Fire Department, and the CPM, the project owner shall reflect all received recommendations in the final documents. If no comments are received from the county within 30 days of submittal, the project owner may proceed with preparation of final documents upon receiving comments from the CPM. Copies of the final HMBP, RMP, and SPCC Plan shall then be provided to the San Bernardino County Fire Department for their records and to the CPM for approval.

Verification: At least 60 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Hazardous Materials Business Plan (HMBP) and a Spill Prevention, Control, and Countermeasure Plan (SPCC) to the CPM for approval.

At least 60 days prior to existence of any hydrogen on the site for commissioning or operations, the project owner shall provide a copy of a final Risk Management Plan (RMP) to the CPM for approval,

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of liquid and gaseous hazardous materials. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least 60 days prior to the delivery of any liquid or gaseous hazardous material to the facility, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 At least 30 days prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to BLM's authorized officer and the CPM for review and approval. The Construction Security Plan shall include the following:

1. Perimeter security consisting of fencing enclosing the construction area;
2. Security guards;
3. Site access control consisting of a check-in procedure or tag system for construction personnel and visitors;
4. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;
5. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
6. Evacuation procedures.

Verification: At least 30 days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

HAZ-5 The project owner shall prepare a site-specific Security Plan for the operational phase and shall be made available to the CPM for review and approval. The project owner shall implement site security measures addressing physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that described below (as per NERC 2002).

The Operation Security Plan shall include the following:

1. Permanent full perimeter fence, at least 8 feet high around the Solar Field;
2. Main entrance security gate, either hand operable or motorized;
3. Evacuation procedures;
4. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;
6. a. A statement (refer to sample, attachment “A”) signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to ascertain the accuracy of employee identity and employment history, and shall be conducted in accordance with state and federal law regarding security and privacy;

   b. A statement(s) (refer to sample, attachment “B”) signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner) that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractor personnel that visit the project site.
7. Site access controls for employees, contractors, vendors, and visitors;
8. Closed circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) with cameras able to pan, tilt, and zoom, have low-light capability, and are able to view the outside entrance to the control room, the two hydrogen generator locations the front gate and emergency access gate(s), and all security fence that directly abuts the public access road; and
9. Additional measures to ensure adequate perimeter security consisting of either:

   a. Security guard present 24 hours per day, 7 days per week, **OR**

   b. Power plant personnel on-site 24 hours per day, 7 days per week and **one** of the following:

      Perimeter breach detectors; **or**

CCTV able to view both site entrance gates and 100 percent of the power block area perimeter

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to the security plans. The CPM may authorize modifications to these measures, or may require additional measures, such as protective barriers for critical power plant components or cyber security depending on circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with appropriate law enforcement agencies and the applicant.

Verification: At least 30 days prior to the initial receipt of hazardous materials on-site, the project owner shall notify the CPM that a site-specific Operations Site Security Plan is available for review and approval. In the Annual Compliance Report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and updated certification statements are appended to the Operations Security Plan. In the Annual Compliance Report, the project owner shall include a statement that the Operations Security Plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

HAZ-6 The holder (project owner) shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder(s) shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b

Verification: A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the CPM concurrent with the filing of the reports to the involved Federal agency or State government.

HAZ-7 The project owner shall ensure that whichever of the two proposed hydrogen storage and handling systems is used in the project, the system is reviewed, evaluated by a Mechanical Engineer registered in California to ensure that it complies with all applicable ANSI, ASME,

and NFPA design codes, and that the system is approved by this person as shown by applying a professional "stamp" to the document review page. No hydrogen will be transported over or under the BNSF mainline or through the BNSF right-of-way.

Verification: At least 30 days prior to the existence of stored hydrogen on site, the project owner shall provide to the CPM for review and approval a copy of design drawings, documentation, and specifications of the hydrogen storage and handling system that has been reviewed, evaluated, approved, and stamped by a Mechanical Engineer registered in the state of California.

HAZ-8 The project owner shall:

a. Conduct a process hazard analysis and prepare a Process Safety Management Plan (PSM Plan) that contains a hazard analysis, including for rail operations using a Hazard and Operability Study (HAZOP) for the hydrogen system.

b. Retain an independent outside third party group of professionals to provide peer review and approval of the process hazard analysis and the PSM plan before they are submitted to the CPM. The outside third party shall have expertise in engineering and process operations, shall include at least one member who has experience and knowledge specific to the processes being evaluated, and shall also include one member knowledgeable in the specific process hazard analysis methodologies being used.

c. Ensure that the hydrogen compressor stations, piping connecting compressor stations and the piping between compressor stations and the hydrogen generator are at least 500 feet from the BNSF right-of-way.

d. Include in the hydrogen handling an automatic system for notification of BNSF operations of any loss of containment from the hydrogen system.

The final report containing the results of the hazard analysis, the final PSM Plan, and the review and approval of the outside third party shall be submitted to the San Bernardino County Fire Department for review and to the CPM for approval.

Verification: At least 30 days prior to receiving hydrogen gas on the site, the project owner shall provide a copy of a final hazard analysis, the final PSM Plan, and the review and approval of the outside third party to the CPM for approval.

Appendix A:
Hazardous Materials Proposed for Use at Calico Solar

Hazardous Materials Usage and Storage During Operations				
Chemical	**Use**	**Storage Location/Type**	**State**	**Storage Quantity**
Insulating oil	Electrical equipment	Electrical equipment (contained in transformers and electrical switches)	Liquid	60,000 gallons initial fill
Lubricating oil	Stirling Engine/dish drives PCU	Equipment 150-gallon recycle tank located in Maintenance Building	Liquid	40,000 gallons initial fill with usage of 21 gallons per month
Hydrogen	PCU working fluid	Generated on-site and stored in pressure vessel	Gas	Either 4,140,000 cubic feet or 20,800,000 cubic feet depending on hydrogen system selected
Acetylene	Welding	Cylinders stored in maintenance buildings	Gas	1,000 cubic feet
Oxygen	Welding	Cylinders stored in maintenance buildings	Gas	1,000 cubic feet
Ethylene glycol	PCU Radiator Coolant, antifreeze	PCU radiator Maintenance Buildings	Liquid	40,000 gal initial fill with usage of 21 gallons per month
Various solvents, detergents, paints, and other cleaners	Building maintenance and equipment cleaning	Three (3) 55-gallon drums and 1-gallon containers will be stored Maintenance Buildings	Liquid	Ten (10) 55-gallon drums Commercial 1-gallon containers
Gasoline	Maintenance vehicles	5,000 gallon AST at refueling station with containment	Liquid	5,000 gallons
Diesel fuel	Maintenance Vehicles	Firewater skid 5,000-gallon AST refueling station with containment	Liquid	100 gallons initial fill 5,000 gallons
Sodium hypochlorite 12.5% solution (bleach)	Disinfectant for potable water	Water treatment structure	Liquid	4 gallons

Notes:
AST = aboveground storage tank
PCU = power conversion unit
Source: Ex. 300, **Appendix A**

(Attachment A)
SAMPLE CERTIFICATION

Affidavit of Compliance for Project Owners

I, _____
(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of:

_____
(Company name)

for employment at:

_____
(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____
(Signature of Officer or Agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

(Attachment B)
SAMPLE CERTIFICATION

Affidavit of Compliance for Contractors

I, _____
(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of:

_____
(Company name)

for contract work at:

_____
(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____
(Signature of Officer or Agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

F. WASTE MANAGEMENT

The Calico Solar Project (formerly the Stirling Energy Systems Solar One Project) will generate nonhazardous and hazardous wastes during construction and operation. This section reviews the project's waste management plans for reducing the risks and environmental impacts associated with handling, storage, and disposal of project-related nonhazardous and hazardous wastes.

Nonhazardous wastes are degradable or inert materials, which do not contain concentrations of soluble pollutants that could degrade water quality and are therefore eligible for disposal at Class II or III disposal facilities. (Cal. Code Regs., tit. 14, § 17200 et seq.)

Hazardous waste consists of materials that exceed criteria for toxicity, corrosivity, ignitability, or reactivity as established by the California Department of Toxic Substances Control (DTSC). (See California Health and Safety Code, § 25100 et seq.; Hazardous Waste Control Act of 1972, as amended; and Cal. Code Regs., tit. 22, § 66261.1 et seq.) State law requires hazardous waste generators to obtain U.S. EPA identification numbers and contract with registered hazardous waste transporters to transfer hazardous waste to appropriate Class I disposal facilities. (Cal. Code Regs., tit. 22, § 66262.10 et seq.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Phase I Site Assessment

The proposed Calico Solar Project site is approximately 4,613 acres of Bureau of Land Management (BLM) managed public lands located in San Bernardino County, California (Ex. 1, p. 3-3; 300, p. C.14-7.) The Burlington Northern Santa Fe (BNSF) railroad bisects the site from west to east. (Exs.1, p. 3-22; 300, p. C.14-7.)

The certification process requires a Phase I Environmental Site Assessment (ESA) to provide the history of how the site was used and a list of hazardous waste releases on or near the site to document the presence of any actual or potential soil or water contamination. If there is reasonable potential that the site contains hazardous substances, a Phase II ESA must be conducted to analyze the contamination and to establish a remediation plan. (Ex. 300, p. C.14-8.)

A Phase I ESA prepared for the project identified a former rock crusher/ore processing area in the northeastern corner of the site; the processing area was once a part of the Logan Mine (Ex. 1, Appendix T and Data Response 88). The Logan Mine produced primarily manganese and iron with trace production of phosphorus-phosphates, silica, and sulfur (Ex. 1, Appendix T and Data Response 89). The record indicates that Staff contacted the County of San Bernardino and verified that manganese and iron ore production and processing were not considered hazardous operations (Ex. 300, p. C.14-9). Therefore, the ESA did not identify any Recognized Environmental Conditions (RECs) in connection with historic or current site operations. A REC is the presence or likely presence of any hazardous substances or petroleum products on a property under the conditions that indicated an existing release, past release, or a material threat of a release of any hazardous substance or petroleum products into structures on the property or in the ground, groundwater, or surface water of the property. However, in the event that the project owner identifies contamination during any phase of construction, we adopt Conditions of Certification **WASTE-1** and **WASTE-2**. These measures require an experienced, qualified Professional Engineer or Professional Geologist be available if contaminated soil is encountered, a determination of the nature and extent of the contaminated soil, and a report that documents findings and recommended actions. (Ex. 300, pp. C-14-9 – C.14-10.)

2. Construction

Site preparation and construction of the proposed project will last approximately 44 months and generate both non-hazardous and hazardous wastes in solid and liquid forms. (Exs.1, p. 5.14-1; 300, p. C.14-10.) Before construction can begin, the project owner will be required to develop and implement a Construction Waste Management Plan per proposed Condition of Certification **WASTE-3**. This plan must describe all waste streams and methods of managing each waste. Implementation of this plan will ensure that the project owner manages wastes in accordance with appropriate LORS. (Ex. 300, pp. C.14-10 to C.14-12.)

a. Nonhazardous Wastes

Construction activities (including construction of the substation and portable SunCatcher assembly buildings) will generate an estimated 40 cubic yards per week of non-hazardous solid wastes, consisting of scrap wood, steel, glass, plastic, and paper. Of these items, the project owner will separate recyclable materials and remove as needed to recycling facilities. Non-recyclable materials

(insulation, other plastics, food waste, roofing materials, vinyl flooring and base, carpeting, paint containers, packing materials, etc.) will be disposed of at a Class III landfill. Decommissioning and removal of the buildings will generate approximately 80 cubic yards of waste consisting of surplus packing materials, lumber, cardboard, lighting, gaskets, and wiring. (Exs. 1, Data Response 172; 300, C.14-10.) We adopt Condition of Certification **WASTE-3** requires the project owner/operator to identity all waste streams and the management method used for each waste stream, which will ensure adequate treatment of these non-hazardous wastes. (Ex. 300, p. C.14-10.)

Project construction will generate non-hazardous liquid wastes, including storm water runoff and sanitary waste. Storm water runoff will be managed in accordance with appropriate LORS. Sanitary wastes will be pumped to tanker trucks by licensed contractors for transport to a sanitary water treatment plant. Please see the **Soil and Water Resources** section of this Decision for more information on the management of project wastewater. (Ex. 300, pp. C.14-10 to C.14-11.)

b. Hazardous Wastes

During construction, anticipated hazardous wastes include waste paint, spent construction solvents, waste cleaners, waste oil, oily rags, waste batteries, and spent welding materials. Estimated amounts are 1 cubic yard of empty containers (per week), 200 gallons of oils, solvents, and adhesives (every 90 days), and 20 batteries (per year). The project owner will return empty hazardous material containers to the vendor or dispose at a hazardous waste facility; solvents, used oils, paint, oily rags, and adhesives will be recycled or disposed at a hazardous waste facility; and spent batteries will be disposed at a recycling facility. (Exs. 1, **Table 5.14-2**; 300, p. C.14-11.)

Under state law, the project owner will be required to obtain a unique hazardous waste generator identification number for the site prior to starting construction, which will also be required for operation of the facility. Therefore, we adopt Condition of Certification **WASTE-4** to ensure compliance with California Code of Regulation Title 22, Division 4.5.

The project owner will collect hazardous waste in accumulation containers and store them in a lay down area, warehouse/shop area, or storage tank on equipment skids for less than 90 days. Licensed hazardous waste collection and disposal companies will manifest, transport, and dispose of accumulated wastes

at a permitted hazardous waste management facility. We find that wastes will be disposed of in accordance with applicable LORS. Should any construction waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner will notify the Compliance Project Manager (CPM) whenever the owner becomes aware of this action as required by the proposed Condition of Certification **WASTE-5**. (Ex. 300, p. C.14-11.)

In the event that construction activities identify potentially contaminated soils, specific waste handling, disposal, or other precautions may be necessary pursuant to hazardous waste management LORS. We adopt Conditions of Certification **WASTE-1** and **WASTE-2** to address any soil contamination that may be encountered during construction of the project and to support compliance with LORS. (Ex. 300, p. C-14-11.)

Further, the Integrated Waste Management Act of 1989 [Assembly Bill (AB) 939, Sher, Chapter 1095, Statutes of 1989] set landfill waste diversion goals of 50 percent (by 2000) for local jurisdictions. While the Calico Solar Project is not responsible to a local jurisdiction, we adopt Condition of Certification **WASTE-6** to ensure the project owner/operator meets waste diversion goals of the construction and decommissioning program, to ensure project wastes are managed properly, and to further reduce potential impacts to local landfills from project wastes. Therefore, we find that all construction wastes will be disposed of in accordance with all applicable LORS. (Ex. 300, p. C-14-11.)

3. Operation

The Calico Solar Project will generate both non-hazardous and hazardous wastes. To address waste generated during operation, we adopt Condition of Certification **WASTE-7**. This Condition requires the project owner/operator to maintain an accurate record of the project's waste storage, generation, and disposal, and requires compliance with waste regulations during operation. (Ex. 300, p. C-14-12.)

a. Nonhazardous Wastes

Non-hazardous solid wastes generated during project operations will consist of glass, paper, wood, plastic, cardboard, deactivated equipment and parts, defective or broken electrical materials, empty non-hazardous containers, and other miscellaneous solid wastes. The project will generate approximately 10 cubic yards of non-hazardous solid waste per week. (Exs. 1, **Table 5.14-3**; 300

p. C.14-12.) Such wastes will be recycled to the greatest extent possible, and the remainder will be removed on a regular basis for disposal in a Class III landfill. Non-hazardous oily rags (one 55-gallon drum per month) will be laundered at an authorized recycle facility. Sanitary wastewater solids will be treated with an onsite septic system, and sludge will be delivered to an off-site disposal facility. (Ex. 300, p. C.14-12.)

The project will generate non-hazardous liquid wastes during facility operation as discussed in the **Soil and Water Resources** section of this Decision. (Ex. 300, p. C.14-12.)

b. Hazardous Wastes

Hazardous wastes generated during routine project operation include motor oil and coolant from the Power Conversion Unit, batteries, oily absorbent and spent oil filters, and used hydraulic fluid. (Exs. 1, p. 5.14-11; 300, p. C.14-13.) In addition, spills and unauthorized releases of hazardous materials or hazardous wastes may generate contaminated soils or cleanup materials that may require management and disposal as hazardous waste. To ensure proper cleanup and management of hazardous materials spills, we adopt Condition of Certification **WASTE-8**. This measure requires the project owner/operator to document, clean up, and properly manage and dispose of wastes from any hazardous materials spills or releases in accordance with all applicable federal, state, and local requirements. The **Hazardous Materials Management** section of this Decision provides more information on hazardous materials management spill reporting, containment, and spill control and countermeasures plan provisions for the project. (Ex. 300, p. C-14-13.)

The amount of hazardous wastes generated during operation of Calico Solar will be temporarily stored on site, transported off site by licensed hazardous waste haulers, and recycled or disposed of at authorized disposal facilities in accordance with established standards (Title 22, CCR, §66262.10 et seq.). We adopt Condition of Certification **WASTE-5** that requires the project owner/operator to notify the CPM if an enforcement action is initiated by a regulatory agency. (Ex. 300, p. C-14-13.)

The Calico Solar Project will have more than 34,000 gallons of oil on site. A Hazardous Materials Business Plan, which outlines hazardous materials handling, storage, spill response, and reporting procedures, will be prepared before construction activities begin. The Lahontan Regional Water Quality

Control Board will require a Spill Prevention, Control, and Countermeasure Plan (SPCC) (Exs.1, Data Responses 170 & 17; 300, p. C.14-13)1) in accordance with Title 40 CFR, Section 112. Also, Federal Code of Regulations (40 CFR 112 Subpart B) requires owners/operators of non-transportation-related bulk petroleum storage facilities (depending on size) to prepare and maintain a site-specific SPCC Plan. Refer to the **Hazardous Materials Management** section of this Decision for more information. (Ex. 300, pp. C.14-13 to C.14-14.)

4. Potential Impacts on Waste Disposal Facilities

a. Non-Hazardous Solid Wastes

Construction will generate 41 cubic yards and operation will generate 10 cubic yards per week of nonhazardous solid waste (wood, paper/cardboard, glass, plastic, insulation, and concrete). The waste will be stored onsite for less than 30 days, and then recycled or disposed of in a Class III landfill. (Ex. 300, p. C.14-14.)

Four waste disposal facilities in San Bernardino County could take the non-hazardous construction and operation wastes generated by the Calico Solar Project. These facilities have over 93 million cubic yards of remaining combined capacity. (Exs.1, **Table 5.14-1**; 300, C.14-15.). The total amount of non-hazardous solid waste generated from project construction is estimated to be 7,872 cubic yards (41 cubic yards per week for 48 months), and the total amount from lifetime operations is estimated to be 20,800 cubic yards (10 cubic yards per week for 40 years). These quantities include both recyclable and non-recyclable wastes; Additional non-recyclable sanitary sludge (the non-liquid portion of 5,000 gallons of wastewater per month during operation) and saltcake (90,200 pounds per year of operation) will also be disposed off-site (Exs.1, **Table 5.14-3**;. 300, p. C.14-15.). The total non-recyclable solid waste will contribute much less than one percent of the available landfill capacity. We find that disposal of the solid wastes generated by the Calico Solar Project can occur without significantly impacting the capacity or remaining life of any of these facilities. (Ex. 300, pp. C.14-14 to C.14-15.)

b. Hazardous Wastes

Two hazardous waste (Class I) disposal facilities are currently accepting waste and could be used to manage Calico Solar Project wastes: the Clean Harbors Buttonwillow Landfill in Kern County and the Chemical Waste Management

Kettleman Hills Landfill in Kings County. The Kettleman Hills facility also accepts Class II and Class III wastes. In total, there is a combined excess of 16 million cubic yards of remaining hazardous waste disposal capacity at these landfills, with at least 30 years remaining in their operating lifetimes. In addition, the Kettleman Hills facility is in the process of obtaining approval for additional disposal capacity and the Buttonwillow facility has 40 years to reach its capacity at its current disposal rate. (Ex. 300, pp. C.14-14 to C.14-15.)

Hazardous wastes generated during construction and operation will be recycled to the extent possible and practical. The project owner/operator will transport off site those wastes that cannot be recycled to a permitted treatment, storage, or disposal facility. The project will generate approximately 225 cubic yards of recyclable and non-recyclable hazardous waste over the 48-month construction period. The project will generate approximately 50 cubic yards of hazardous non-recyclable waste over the 40-year operating lifetime. Thus, we find that hazardous wastes from the Calico Solar Project requiring off-site disposal will be significantly less than the remaining capacity of either Class 1 waste facility. (Ex. 300, p. C.14-14.)

The closure or decommissioning of the Calico Solar Project will produce both hazardous and non-hazardous solid and liquid waste. The project's General Compliance Conditions of Certification, including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. While we expect that there will be adequate landfill capacity available to dispose of both non-hazardous and hazardous waste from the closure or decommissioning of the proposed project, Conditions of Certification **WASTE-3** through **WASTE-8** will continue to apply to the Calico Solar Project during closure or decommissioning of the project. (Ex. 300, p. C.14-14.)

5. Cumulative Impacts

Impacts of the Calico Solar Project will combine with impacts of past, present, and reasonably foreseeable projects to result in a contribution to local and regional cumulative impacts related to waste management. The amount of non-hazardous and hazardous wastes generated during construction and operation of the Calico Solar Project will add to the total quantity of hazardous and non-hazardous waste generated in San Bernardino County. However, the project will generate wastes in modest quantities, employ waste recycling wherever practical, and several treatment and disposal facilities have sufficient capacity

available to handle the volumes of wastes the project will generate. Therefore, we find that the waste generated by the project will not result in significant cumulative waste management impacts either locally or regionally. (Ex. 300, p. C.14-25.)

6. Public Comment

No public comment was received regarding **Waste Management**.

FINDINGS OF FACT

Based on the uncontroverted evidence, the Commission makes the following findings:

1. The project will generate nonhazardous and hazardous wastes during construction and operation.

2. Based on the preparation of a project-specific Phase I Environmental Site Assessment, no recognized environmental conditions (REC), or historical RECs were identified on the project site.

3. Conditions of Certification **WASTE-1**, **WASTE-2,** and **WASTE-3** adequately address any soil contamination that may be encountered during construction of the project, including preparation of a Construction Waste Management Plan.

4. The construction contractor and the project owner/operator is required to obtain a unique hazardous waste generator identification number for the site prior to starting construction, pursuant to Condition of Certification **WASTE-4**.

5. The project owner/operator has committed to dispose of all construction wastes in accordance with all applicable LORS.

6. Project compliance with LORS is sufficient to ensure that no significant impacts will occur as a result of project waste management activities during construction.

7. Condition of Certification **WASTE-5** requires the project owner to notify the CPM in writing of any impending enforcement action by any agency.

8. The project owner/operator has committed to recycle, as applicable, all non-hazardous wastes to the greatest extent possible and non-recyclable wastes will be collected by a licensed hauler and disposed of in a solid waste disposal facility (Class III landfill).

9. To reinforce this commitment, Condition of Certification **WASTE-6** requires a reuse/recycling plan that addresses at least 50 percent of the construction and demolition materials.

10. Condition **WASTE-7** requires the Project Owner to develop and implement an Operation Waste Management Plan to identify all waste streams and the methods of managing each waste.

11. Condition of Certification **WASTE-8** requires the project owner/operator to report, clean up, and remediate as necessary, any hazardous materials spills or releases in accordance with all applicable federal, state, and local requirements.

12. The disposal of the solid wastes generated by Calico Solar Project can occur without significantly impacting the capacity or remaining life of any of the facilities located in San Bernardino County, Kings County, or Kern County.

13. Liquid wastes will be classified for appropriate disposal and managed in accordance with the Conditions of Certification listed in the **Soil and Water Resources** section of this Decision.

14. Disposal of project wastes will not result in any significant direct, indirect, or cumulative impacts on existing waste disposal facilities.

CONCLUSIONS OF LAW

1. Implementation of the Conditions of Certification, below, and the waste management practices described in the evidentiary record will reduce potential impacts to insignificant levels and ensure that project wastes are handled in an environmentally safe manner.

2. The management of project wastes will comply with all applicable laws, ordinances, regulations, and standards related to waste management as identified in the pertinent portions of **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall provide the resume of an experienced and qualified professional engineer or professional geologist, who shall be available during site characterization (if needed), demolition, excavation, and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The professional engineer or professional geologist shall be given authority by the project owner to oversee any earth moving

activities that have the potential to disturb contaminated soil and impact public health, safety and the environment.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the resume to the CPM for review and approval.

WASTE-2 If potentially contaminated soil is identified during site characterization, demolition, excavation or grading at either the proposed site or linear facilities, as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the professional engineer or professional geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, representatives of Department of Toxic Substances Control or Regional Water Quality Control Board, and the CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the professional engineer or professional geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If in the opinion of the professional engineer or professional geologist, significant remediation may be required, the project owner shall contact the CPM and representatives of the Department of Toxic Substances Control or Regional Water Quality Control Board, for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the professional engineer or professional geologist to the CPM within five days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-3 The project owner shall prepare a Construction Waste Management Plan for all wastes generated during construction of the facility and shall submit the plan to the CPM for review and approval prior to the start of construction. The plan shall contain, at a minimum, the following:

- A description of all construction waste streams, including projections of frequency, amounts generated, and hazard classifications; and
- Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.

Verification: The project owner shall submit the Construction Waste Management Plan to the CPM for approval no less than 30 days prior to the initiation of construction activities at the site.

WASTE-4 The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency (USEPA) prior to generating any hazardous waste during project construction and operations.

Verification: The project owner shall keep a copy of the identification number on file at the project site and provide documentation of the hazardous waste generation and notification and receipt of the number to the CPM in the next scheduled Monthly Compliance Report after receipt of the number. Submittal of the notification and issued number documentation to the CPM is only needed once unless there is a change in ownership, operation, waste generation, or waste characteristics that requires a new notification to USEPA. Documentation of any new or revised hazardous waste generation notifications or changes in identification number shall be provided to the CPM in the next scheduled compliance report.

WASTE-5 Upon notification of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts, and describe how the violation will be corrected.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the way project-related wastes are managed.

WASTE-6 The project owner shall provide a reuse/recycling plan for at least 50 percent of construction and demolition materials prior to any building or demolition. The project owner shall ensure compliance and shall provide proof of compliance documentation to the CPM, including a recycling and reuse summary report, receipts, and records of measurement. Project mobilization and construction shall not proceed until the CPM issues an approval document.

Verification: At least 60 days prior to the start of any construction or demolition activities, the project owner shall submit a reuse recycling plan to the CPM for review and approval. The project owner shall ensure that project activities are consistent with the approved reuse/recycling plan and provide adequate documentation of the types and volumes of wastes generated, how the wastes were managed, and volumes of wastes diverted. Project mobilization and construction shall not proceed until CPM issues an approval document. Not later

than 60 days after completion of project construction, the project owner shall submit documentation of compliance with the diversion program requirements to the CPM. The required documentation shall include a recycling and reuse summary report along with all necessary receipts and records of measurement from entities receiving project wastes.

WASTE-7 The project owner shall prepare an Operation Waste Management Plan for all wastes generated during operation of the proposed project and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- A detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;
- Management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;
- Information and summary records of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;
- A detailed description of how facility wastes will be managed, and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure; and
- A detailed description of how facility wastes will be managed and disposed of upon closure of the facility.

Verification: The project owner shall submit the Operation Waste Management Plan to the CPM for approval no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary.

The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan; and update the Operation Waste Management Plan as necessary to address current waste generation and management practices.

WASTE-8 The project owner shall ensure that all spills or releases of hazardous substances, hazardous materials, or hazardous waste are documented and cleaned up and that wastes generated from the release/spill are properly managed and disposed of, in accordance with all applicable federal, state, and local requirements.

Verification: The project owner shall document management of all unauthorized releases and spills of hazardous substances, hazardous materials, or hazardous wastes that occur on the project property or related linear facilities. The documentation shall include, at a minimum, the following information: location of release; date and time of release; reason for release; volume released; how release was managed and material cleaned up; amount of contaminated soil and/or cleanup wastes generated; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release. A copy of the unauthorized release/spill documentation shall be provided to the CPM within 30 days of the date the release was discovered.

VI. ENVIRONMENTAL ASSESSMENT

A. BIOLOGICAL RESOURCES

The Commission must consider the potential impacts of project-related activities on biological resources, including state and federally listed species, species of special concern, wetlands, and other resources of critical biological interest such as unique habitats. The evidence describes the biological resources in the vicinity of the project site and linear alignments, assesses the potential for adverse impacts, proposes mitigation measures to reduce those impacts and assesses the project's compliance with applicable laws, ordinances, regulations, and standards (LORS).

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Project Description

The Calico Solar Project is located in Southern California's Mojave Desert, approximately 37 miles east of the city of Barstow. It is bordered on the south by Interstate 40 (I 40), on the east by the Southern California Edison transmission line corridor, and the Burlington Northern and Santa Fe rail corridor bisects the project site from east to west. The Cady Mountain Wilderness Study Area (WSA) is located north of the Calico Solar Project site. The Pisgah Crater, within the BLM-designated Pisgah Area of Critical Environmental Concern (ACEC), is located south and east of the project (south of I 40 by several miles). The ACEC designation is used by the BLM to identify areas with special management issues and priorities related to the conservation of important natural, cultural, and scenic resources, and to identify natural hazards. The Pisgah ACEC supports several sensitive species including Mojave fringe-toed lizard (Uma scoparia), desert tortoise (Gopherus agassizii), crucifixion thorn (Castela emoryi), white-margined beardtongue (Penstemon albomarginatus), and sand linanthus (Linanthus arenicola). Several underground and above ground utilities traverse the area.

The Cady Mountains north of the project site have been designated as a Wilderness Study Area by the BLM. Wilderness Study Areas meet the criteria to be considered Wilderness Areas, but have not been designated as such by Congress. BLM is required to maintain the wilderness characteristics of a Wilderness Study Area until a final decision is made by Congress as to whether or not to include the area as part of the National Wilderness Preservation System

(NWPS). A herd of Nelson's bighorn sheep inhabit the Cady Mountains Wilderness Study Area.

The Ord-Rodman Desert Wildlife Management Area (DWMA) is located adjacent to the southwest portion of the project site. This DWMA, which includes federally designated critical habitat for desert tortoise, was established by the West Mojave Plan for the conservation and recovery of the desert tortoise. Public lands within DWMAs are designated as ACECs. A recent study completed in cooperation between Caltrans and the CDFG has also identified the project area as an essential biological connectivity area between the Bristol (to the east of the project area) and Ord Mountains (to the south).

The Mojave Desert is located between the Great Basin Desert to the north and the Colorado Desert to the south, and lies in the rain shadow of the Sierra Nevada and Transverse Mountain ranges. It is generally a large alluvial-filled basin with many isolated mountain ranges. The Mojave receives most precipitation during winter months, although summer thunderstorms also occur. The average annual precipitation at Daggett Airport, approximately 23 miles east of the project site, is approximately 3.8 inches, and average monthly temperatures range between 36 and 104°F.

The Applicant originally proposed the project to generate 850-MW on 8,230 acres. To reduce impacts primarily to biological resources the Applicant reduced the project footprint to 6,215 acres of land within the original foot print. Again in an effort to address impacts associated with the proposed project, the Applicant proposed addition reduced acreage scenarios on September 10, 2010. The Applicant's preferred reduced acreage scenario, Scenario 5.5 is proposed to generate 663.5 MW on 4,613 acres of land within the originally proposed project footprint. (EX. 317, p. B.1-2) With the exception of the project's water well site, the land is managed by the BLM. A detailed description of the CSP's equipment and structures and operational activities is provided in the **Project Description** section of this decision.

2. Biological Setting

The project location includes several linear development features including I-40, BNSF railway, and SCE transmission lines. Additionally, the area between the BNSF railroad and I 40 is isolated by the highway and railroad and portions of the site have been subject to repeated disturbance from pipeline development. Besides these features, the project area is primarily open land ranging in

elevation from approximately 1,925 to 3,050 feet (587 to 930 m) above mean sea level. The site lies within a broad alluvial floodplain that transports runoff from the Cady Mountains to the north. In addition, a collection of small to medium channels intersects the project from the south and east. All of these drainages generally collect and flow in a westerly direction.

Project site activities would impact three vegetation communities: desert saltbush scrub, Mojave creosote bush scrub, and desert microphyll woodland. In addition, there are 28 acres of developed land uses (e.g., roads, railroads, transmission lines, and underground gas pipelines) on the site.

Mojave creosote bush scrub: The majority of the project site (approximately 5,946 acres) is Mojave creosote bush scrub. The dominant shrub species are creosote bush (Larrea tridentata) and white bursage (Ambrosia dumosa). Other common shrubs include desert senna (Senna armata), Nevada ephedra (Ephedra nevadensis), encelia (Encelia farinosa, E. actoni, E. frutescens), and range ratany (Krameria erecta, K. grayii. Shrubs are typically widely spaced and support a diverse assemblage of annual and perennial herbs in years of adequate seasonal precipitation.

Creosote bush is well known for forming “creosote rings,” which are very old plants growing from slowly-spreading root crowns. Creosote rings are protected under the San Bernardino County Plant Protection and Management Ordinance and were not evaluated in the Biological Resources Technical Report or the AFC In some cases, these rings are more than 10,000 years old and apparently develop on the surfaces of very old bajadas. Staff did not observe creosote rings at the project site and the project appears to be situated on younger alluvial surface than the sites where creosote rings have been recorded. Staff also reviewed aerial images of the proposed project site and did not observe any indication of creosote rings.

Catclaw acacia thorn scrub (desert microphyll woodland): Within the mapped creosote bush scrub, dry desert washes in the northern portion of the proposed project site (i.e., foothills of the Cady Mountains and the upper bajada) support catclaw acacia (Acacia greggii) at various densities, sometimes in equal or greater cover and density than creosote bush. Scattered blue palo verde (Parkinsonia florida) and smoke tree (Psorothamnus spinosus) are also found in these washes.

Catclaw acacia is a large, deep-rooted shrub or small tree, characteristic of desert washes, occurring in habitats similar to other desert microphyllous wash woodland species. It resprouts rapidly following disturbance by floods, and seed dispersal and germination are apparently initiated by flooding. The seeds are apparently important to small mammals and, historically, to Native Americans. Catclaw acacia thorn scrub has no special conservation status ranking.

Lower elevation wash and sandfield vegetation: Areas mapped as creosote bush scrub in the southern part of the project area, generally from about 0.25 mile north of the BNSF railroad tracks and southward to the southern project area boundary, include scattered smoke trees. These areas are characterized by sandy soils, in deep sandy washes, open sandfields, and active windblown sandfields.

Sand transport from desert mountain ranges downslope to bajadas and, in some cases, dunelands, occurs throughout the deserts by fluvial and aeolian (i.e., water and wind) processes. Infrequent flooding transports sand downslope along desert washes. Prevailing winds sort sands according to grain size and further transport them downwind. Sediments from the Cady Mountains, upslope, are transported by fluvial processes toward the southern part of the project site, and redistributed by wind, particularly the southeastern part of the site, where fine windblown sands spread across the lower bajada and small hills in a small dune system, associated with active channels and partially stabilized sandfields.

Smoke tree is a shrub or small tree characteristic of desert washes and arroyos. In some areas it may be the dominant or co-dominant species, often occurring with other desert wash species (see catclaw acacia thorn scrub, above). Mixed stands, where smoke trees occur with smaller creosote bush or white bursage, may be classified as smoke tree woodland, even where smaller shrubs constitute as much as twice the overall cover. On the project site, a few small smoke trees occur in washes of the upper bajadas, and they are more common in lower washes where they are conspicuous, but do not make up a substantial proportion of total cover. Smoke tree is relatively short lived (to approximately 50 years), and is strongly tied to active washes. Its stands regenerate following floods, which abrade dormant seeds, permitting them to germinate. Smoke trees are protected under the San Bernardino County Plant Protection and Management Ordinance.

Big galleta shrub-steppe (Pleuraphis rigida herbaceous alliance): On the proposed project site, big galleta (Pleuraphis rigid = Hilaria rigida) occurs in low

sandy areas and around the margins of dunes in the southeastern portion of the site. These areas are too small to map as separate units. In dune areas, it is often interspersed with small stands of the desert sand verbena (Abronia villosa) or desert panic grass (Panicum urvilleanum).

Desert saltbush scrub: The applicant mapped 242 acres of desert saltbush scrub on the project site. It is strongly dominated by desert saltbush (Atriplex polycarpa) with white burrobush (Hymenoclea salsola) and inkweed (Suadea moquinii) at lower cover; generally occurring on fine-textured, poorly drained saline or alkaline soils. On the project site, staff noted at least two Atriplex-dominated shrubland types in relictual wash or bajada surfaces in the southwestern part of the project site. None of the Mojave desert saltbush shrublands have special conservation status.

Jurisdictional Waters

The project site is located on a large alluvial fan that supports numerous drainages that flow from the Cady Mountains. This watershed consists of 43 square miles and is capable of producing substantial flood flows during the 100 year storm event. Because of the historic flow patterns, arid climate, and various levels of soil development desert washes can vary substantially in their characteristics.

Due to the arid conditions of the area, most of the surface waters that exist in the region are ephemeral streams, typically dry washes that only flow in response to precipitation. Regional storms, which generally occur in the winter months, are typically of low intensity, but can create short-lived ephemeral streams and cause significant flooding on the playa lake beds. Alternatively, intense summer thunderstorms within the mountainous portions of the area can produce flooding in the low-lying valleys. During summer months, ephemeral streams may only last for a couple of hours. Conversely during the winter, flow within portions of these drainages has the potential to last up to several days. The West Mojave Plan (WMP) indicates the most important hydrologic features of these basins are the alluvial fans.

A total of 282.8 acres of State Jurisdictional Waters exist within the original Project Disturbance Area. Effected jurisdictional waters were reduced in the site revised filed by the Applicant on September 10, 2010. The proposed Scenario 5.5 site will impact an estimated 155.2 acres of Jurisdictional Waters. (EX. 317, p. C.2-12) All of these drainages are ephemeral and are largely characterized by

sparse creosote bush scrub with small associations of microphyll woodland species such as catclaw acacia thorn scrub, smoke tree woodland, and big galleta shrub-steppe. In many locations the channels are largely devoid of vegetation or support scattered populations of annual wildflowers and grasses. The US Army Corps of Engineers has determined that the site does not support waters meeting the definition of Waters of the United States. No wetlands are present in the project footprint.

Wildlife

The project area supports a broad diversity of wildlife species. With the exception of the areas surrounding the BNSF railroad and existing roads the majority of the site consists of relatively undisturbed desert scrub communities. While the site primarily supports creosote bush scrub, a number of unique features occur throughout the site, including outcrops of black volcanic rock associated with lava flows from Pisgah Crater and wind-blown sand dune habitats. Numerous sandy washes also occur throughout the site. These features increase the biodiversity of the site, as some habitat specialists use these areas exclusively, while other generalist species are more wide-ranging in the region. For example, the Mojave fringe-toed lizard is closely associated with sand dunes, sand sheets, and sandy soils in the Mojave Desert. In addition, genetic variants of several reptile and small mammal species have been recorded in association with the dark substrates from the Pisgah lava flows, including melanistic (e.g., darker colored) forms of desert horned lizard (Phrynosoma platyrhinos), side-blotched lizard (Uta stansburiana), and long-nosed leopard lizard (Gambelia wislizenii). In addition, some mammal variation has been documented in this region including coat color variation in desert woodrats (Neotoma lepida).

Some of the species detected by the applicant during surveys conducted between 2007 and 2010 include desert tortoise (Gopherus agassizii), Mojave fringe-toed lizard (Uma scoparia), side-blotched lizard, desert iguana (Dipsosaurus dorsalis), western whiptail (Aspidoscelis tigris), zebra-tailed lizard (Callisaurus draconoides), desert horned lizard, western banded gecko (Coleonyx variegatus), long-nosed leopard lizard, and sidewinder (Crotalus cerastes). Mammals recorded during the surveys include black-tailed jackrabbit (Lepus californicus), desert cottontail (Sylvilagus audubonii), round-tailed ground squirrel (Spermophilus tereticaudus), coyote (Canis latrans), American badger (Taxidea taxus), bobcat (Lynx rufus), and desert kit fox (Vulpes macrotis).

Despite the moderate to low shrub density that occurs on the site the project area provides forage, cover, roosting, and nesting habitat for a variety of bird species. In addition, many species, such as golden eagle (Aquila chrysaetos), are known to nest in the adjacent Cady Mountains and have been observed over the project area. Common resident and migratory birds detected in and near the Calico Solar Project site between 2007 and 2010 by the applicant include common nighthawk (Chordeiles minor), mourning dove (Zenaida macroura), white-crowned sparrow (Zonotrichia leucophrys), horned lark (Eremophila alpestris), black-throated sparrow (Amphispiza bilineata), and yellow-rumped warbler (Dendroica coronata). Common raven (Corvus corax), house finch (Carpodacus mexicanus), California quail (Callipepla californica), northern mockingbird (Mimus polyglottos), sage sparrow (A. belli), western kingbird (Tyrannus verticalis), western meadowlark (Sturnella neglecta), and violet-green swallow (Tachycineta thalassina) were also observed. Raptors and owls detected at or near the site include red-tailed hawk (Buteo jamaicensis), golden eagle, burrowing owl (Athene cunnicularia), Swainson's hawk (Buteo swainsoni), prairie falcon (Falco mexicanus), and turkey vulture (Cathartes aura).

3. Special-Status Species

Biological Resources Table 1, below, lists special-status species that are known to occur or which could potentially occur in the project vicinity. Many of these special-status plants and animals are unlikely to occur at the CSP site due to lack of suitable habitat. However, quite a few were detected during the 2007/2008 surveys or otherwise known to occur at or near the site; they are indicated by **bold-face type**.

Potential for occurrence is defined as follows:

Present: Species or sign of their presence observed on the site during surveys conducted for the proposed project (species that are present are noted in **bold text** in **Biological Resources Table 3**).

High: Species or sign not observed on the site, but reasonably certain to occur on the site based on conditions, species ranges, and recent records (within approximately 20 years and 10 miles of project site).

Moderate: Species or sign not observed on the site, but conditions suitable for occurrence and/or an historical record (greater than 20 years old) exists in the vicinity (within approximately 10 miles of project site).

Low: Species or sign not observed on the site, and conditions marginal for occurrence.

Not likely to occur: Species or sign not observed on the site, outside of the known range, and conditions unsuitable for occurrence.

Biological Resources Table 1
Special-Status Species, Their Status, and Potential Occurrence at the Calico Solar Project Site

Scientific Name	Common Name	Status	Potential For Occurrence On-Site
PLANTS			
Androstephium breviflorum	Pink funnel-lily, Small-flowered androstephium	CNPS 2.2	Present
Astragalus jaegerianus	Lane Mountain milk-vetch	FE, CNPS:1B.1	Not likely to occur
Astragalus lentiginosus var. *borreganus*	Borrego milk-vetch	CNPS: 4.3	Low
Blepharidachne kingii	King's eyelash grass	CNPS: 2.3	Low
Calochortus striatus	Alkali mariposa lily	BLM S, CNPS: 1B.2	Not likely to occur
Camissonia boothii var. *boothii*	Booth's evening primrose	CNPS: 2.3	Moderate
Cassia – see *Senna*			
Castela emoryi	Emory's crucifixion thorn	CNPS: 2.3	Low
Cleomella brevipes	Short-pedicelled cleomella	CNPS: 4.2	Low
Coryphantha alversonii [*Escobaria vivipara* var. *alversonii*]	Foxtail cactus	CNPS: 4.3	Present
Coryphantha chlorantha [*Escobaria vivipara* var. *deserti*]	Desert pincushion	CNPS: 2.1	Low
Coryphantha vivipara var. *rosea* [*Escobaria vivipara* var. *rosea*]	Viviparous foxtail cactus	CNPS: 2.2	Low
Cryptantha holoptera	Winged cryptantha	CNPS: 4.3	Present (unconfirmed)
Cymopterus deserticola	Desert cymopterus	BLM S, CNPS: 1B.2	Low
Cymopterus multinervatus	Purple-nerve cymopterus	CNPS: 2.2	Low
Cynanchum utahense	Utah vine milkweed	CNPS: 4.2	Present
Eriophyllum mohavense	Barstow woolly-sunflower	BLM S, CNPS: 1B.2	Low
Escobaria – see *Coryphantha*			
Gilia – see *Linanthus*			
Linanthus maculatus	Little San Bernardino Mountains linanthus	BLM S, CNPS: 1B.2	Not likely to occur
Loeflingia squarrosa var. *artemisiarum*	Sagebrush loeflingia	CNPS: 2.2	Not likely to occur
Lupinus sp.	Undescribed lupine	n/a	Low
Mentzelia eremophila	Solitary blazing-star	CNPS: 4.2	High
Mentzelia tridentata	Creamy blazing-star	BLM S, CNPS: 1B.3	Low
Mimulus mohavensis	Mojave monkeyflower	BLM S, CNPS: 1B.2	Low

Scientific Name	Common Name	Status	Potential For Occurrence On-Site
Muilla coronata	Crowned muilla	CNPS: 4.2	Present (unconfirmed)
Nemacaulis denudata var. *gracilis*	Slender woolly-heads	CNPS: 2.2	Low
Pediomelum castoreum	Beaver Dam breadroot	CNPS: 4.3	Low
Penstemon albomarginatus	White-margined beardtongue	BLM S, CNPS: 1B.1	Present
Phacelia coerulea	Sky-blue phacelia	CNPS: 2.3	Not likely to occur
Polygala acanthoclada	Thorny milkwort	CNPS: 2.3	Low
Senna covesii [*Cassia covesii*]	Coves' cassia	CNPS: 2.2	Present (unconfirmed)
Sphaeralcea rusbyi var. *eremicola*	Rusby's desert mallow	BLM S, CNPS: 1B.2	Low
Tripterocalyx micranthus	Small-flowered sand-verbena	CNPS: 2.3	Present (unconfirmed)
Wislizenia refracta ssp. *refracta*	Jackass-clover	CNPS: 2.2	Moderate
REPTILES			
Anniella pulchra pulchra	Silvery legless lizard	CSSC	Low
Gopherus agassizii	Desert tortoise	FT, ST	Present
Heloderma suspectum cinctum	Banded gila monster	BLM S, CSSC	Low
Lichanura trivirgata	Rosy boa	n/a	Moderate
Uma scoparia	Mojave fringe-toed lizard	BLM S, CSSC	Present
BIRDS			
Accipiter cooperii	Cooper's hawk	CDFG WL	Low
Aquila chrysaetos	Golden eagle	BLM S, SP, CDFG WL	Present
Asio otus	Long-eared owl	CSSC	High
Athene cunicularia	Western burrowing owl	BLM S, CSSC	Present
Buteo regalis	Ferruginous hawk	CDFG WL	High
Buteo swainsoni	Swainson's hawk	BLM S, ST	Present (not nesting)
Chaetura vauxi	Vaux's swift	CSSC	Low
Charadrius montanus	Mountain plover	BLM S, CSSC	Moderate
Circus cyaneus	Northern harrier	CSSC	Low
Eremophila alpestris actia	California horned lark	CDFG WL	Low
Falco columbarius	Merlin	CDFG WL	High
Falco mexicanus	Prairie falcon	CDFG WL	Present (not nesting)
Lanius ludovicianus	Loggerhead shrike	FBCC, CSSC	Present
Polioptila melanura	Black-tailed gnatcatcher	n/a	High
Toxostoma bendirei	Bendire's thrasher	BLM S, CSSC	Present
Toxostoma lecontei	LeConte's thrasher	BLM S, CDFG WL	Present
MAMMALS			
Antrozous pallidus	Pallid bat	BLM S, CSSC	Moderate
Corynorhinus townsendii	Townsend's big-eared bat	BLM S, CSSC	Present
Euderma maculatum	Spotted bat	BLM S, CSSC	Low

Scientific Name	Common Name	Status	Potential For Occurrence On-Site
Eumops perotis	Western mastiff bat	BLM S, CSSC	High
Ovis Canadensis nelsoni	Nelson's bighorn sheep	BLM S, SP	Present
Spermophilus mohavensis	Mohave ground squirrel	BLM S, ST	Not Likely to Occur
Taxidea taxus	American badger	CSSC	Present
Vulpes macrotis arsipus	Desert kit fox	n/a	Present

FE = Federally listed Endangered
FT = Federally listed Threatened
FD = Federally Delisted
FC = Federal Candidate
FBCC = Federal Bird of Conservation Concern
BLM S = BLM Sensitive
SE = State listed Endangered
ST = State listed Threatened (wildlife)
SR = State listed Rare (plants)
CSSC = California Species of Special Concern (wildlife)
SP = State Fully Protected Species
CDFG WL = California Department of Fish and Game Watch List species

CNPS (California Native Plant Society) Designations:

List 1A = Plants presumed extinct in California
List 1B = Plants considered by CNPS to be rare, threatened, or endangered in California, and throughout their range
List 2 = Plants rare, threatened, or endangered in California, but more common elsewhere in their range
List 3 = Plants about which we need more information – a review list.
List 4 = Plants of limited distribution – a watch list

CNPS Threat Rank:

.1 = Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 = Fairly endangered in California (20-80% occurrences threatened)
.3 = Not very endangered in California (20% of occurrences threatened or no current threats known)

(Ex. 300, pp. C.2-25 – C.2-27.)

a. Plants

Small-Flowered Androstephium (Androstephium breviflorum)

This species is ranked on CNPS List 2.2 (rare, threatened or endangered in California but more common elsewhere) and as S2.1 by CDFG (fewer than 1000 known individuals or fewer than 2000 acres of occupied habitat). Small-flowered androstephium is a bulb, generally occurring in sandy or rocky soil, in open desert shrublands of eastern California, through the Great Basin, to western Colorado. The documentation of many new occurrences indicates that small-flowered androstephium is more common in California than previously thought. However, a large percentage (85 percent) of the occurrences documented in the CDFG's California Natural Diversity Database (CNDDB) are threatened by development (solar energy projects and Fort Irwin expansion).

Small-flowered androstephium was reported from 52 locations on the project site and 14 additional occurrences within a 1000 foot buffer surrounding the site. Numerous additional occurrences were documented on public lands to the west and east, including many in the Pisgah ACEC. In 2010, more than 1,500

locations were documented on the site and it was reported as “ubiquitous” throughout the southern part of the project site. (Ex. 300, pp. C.2-27 – C.2-28.)

Lane Mountain Milk-Vetch (Astragalus jaegerianus)

This species is the only listed (endangered) plant species with potential to occur in the project area. It was not found in or near the project site. Lane Mountain milk-vetch is locally endemic in the central Mojave Desert, generally on and near Fort Irwin. All known occurrences are about 25 miles northwest of the proposed project site, and at higher elevations (3100, 4200 feet) than occur on the site.

The Calico Solar Project site is not within designated critical habitat or areas formerly proposed for designation as Lane Mountain milk-vetch critical habitat. In 2004, the USFWS proposed four Critical Habitat Units, all to the north of the proposed project site. In 2005, the USFWS finalized its critical habitat designation rule, designating 0 acres of critical habitat.

Lane Mountain milk-vetch is a perennial herb that climbs up through desert shrubs. It flowers during spring and dies back during summer. It almost always occurs on shallow soils on low ridges or hills of granitic outcrops rather than bajadas. It is unlikely to occur on the project site because of its distance from known occurrences and poorly suitable bajada habitat that occurs throughout most of the project site. (Ex. 300, p. C.2-28.)

Emory’s Crucifixion Thorn (Castela emoryi)

Crucifixion thorn is known from only a few widely scattered occurrences in the Sonoran Desert and southern Mojave Desert in eastern California, southwestern Arizona, northern Baja California, and western Sonora (Mexico). Most populations are fairly small, though one occurrence in Imperial County near the Mexican border includes about a thousand plants. Crucifixion thorn is a leafless, densely spiny shrub, about 6 to 20 ft. tall. It occurs along washes or other places where water may accumulate on plains and bajadas. Its fruits are held on the plant for several years, and the seeds are surrounded by a thick carpel wall which must be eroded before germination occurs. Seeds may have historically been dispersed by now-extinct Pleistocene grazing animals. The common name “crucifixion thorn” is also used for two unrelated plant species, Koeberlinia spinosa and Canotia holacantha.

Emory's crucifixion thorn was found at three locations on the formerly-proposed project site. All three locations are near the toe slopes of the Cady Mountains, outside of the amended project footprint. (Ex. 300, p. C.2-28.)

Foxtail Cactus (Coryphantha alversonii = Escobaria vivipara var. alversonii)

Foxtail cactus is typically found in sandy and rocky areas consisting of granitic soils within Mojavean desert scrub habitat from 245 5000 feet in elevation. It is recorded from the eastern Mojave and Colorado Deserts in Imperial, Riverside, and San Bernardino Counties, California. It is a stem succulent that is a CNPS List 4.3 species. It flowers from April through June (CNPS 2010). It was reported on the Calico Solar Project site at one location during the 2008 surveys for the proposed project, though the occurrence was not mapped in the applicant's Biological Resources Technical Report (SES 2009aa). It was not relocated on-site during the follow-up surveys (TS 2010i). Suitable desert shrubland habitat occurs throughout the site.

Winged Cryptantha (Cryptantha holoptera)

Winged cryptantha occurs on gravelly or rocky substrates in desert scrub communities at elevations of 328 to 5545 feet (CNPS 2010). It is known in California from the eastern Mojave Desert and Colorado Desert, and also occurs in Nevada, Arizona, Baja California, and Sonora (Mexico) (CNPS 2010). It is an annual herb with grayish foliage that blooms between March and April. It is on CNPS List 4.3. Winged cryptantha was reported in the applicant's list of plant species identified during surveys (SES 2009aa – Appendix D), though its locations were not mapped or quantified in the applicant's Biological Resources Technical Report (SES 2009aa). It was not relocated on-site during the follow-up surveys (TS 2010i). Suitable desert shrubland habitat occurs throughout much of the project site. (Ex. 300, p. C.2-29.)

Utah Vine Milkweed (Cynanchum utahense)

Utah vine milkweed is a perennial herb found in the Mojave Desert in San Bernardino County and in the Colorado Desert in Riverside, Imperial, and San Diego Counties. This species also occurs in Arizona, Nevada, and Utah (CDFG 2010a). In California its habitat is sandy and gravelly soils, often in washes, where it climbing up through shrubs. Utah vine milkweed is on CNPS List 4.2. It in present on the Calico Solar Project site, as the applicant reported one location onsite near I 40 (SES 2009aa). It was also reported in 2010 (TS 2010i) though its

locations were not mapped or quantified. Additional suitable habitat is found in washes throughout the project area. (Ex. 300, p. C.2-29.)

Undescribed Lupine (Lupinus spec. nov.)

Several lupine specimens collected near the base of the Cady Mountains, north of the present project boundary, do not appear to match any known species. They are similar to bajada lupine (Lupinus concinnus) though they do not match any of the several described varieties of that species. This is an annual species with blue flowers. They are apparently distinct in several characters, particularly the leaflet shape and width. James Andre has noted similar plants elsewhere in the central Mojave Desert. In Andre's experience, the plant appears to be sufficiently rare and geographically restricted to warrant inclusion in either CNPS List 1B or List 4, though he has not researched it enough to recommend such listing. During 2010 field surveys, locations of the undescribed lupine species were mapped throughout the larger project area originally proposed in the AFC. All of these locations are north of the revised project boundary and no occurrences were found within the revised project area. (Ex. 300, p. C.2-29.)

Crowned Muilla (Muilla coronata)

Crowned muilla is on CNPS List 4.2. It occurs in Inyo, Kern, Los Angeles, San Bernardino and Tulare Counties, and east into Nevada. It can be found in chenopod scrub, Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodlands at elevations of about 2500 6400 feet. It is a bulbiferous herb that blooms between March and April. Crowned muilla was reported in the applicant's list of plant species identified during surveys, though it was not mapped or quantified in the applicant's Biological Resources Technical Report and was not relocated during 2010 field surveys. (Ex. 300, p. C.2-30.)

White-Margined Beardtongue (Penstemon albomarginatus)

White-margined beardtongue is the only CNPS List 1B species documented within the proposed project area. It is also managed by the BLM as a sensitive species. White-margined beardtongue occurs in the central Mojave Desert, in and around the Pisgah lava flow, in stabilized or drifting aeolian sand habitat. It is a perennial herb, flowering in spring (between March and May) and dying back to the ground in summer. White-margined beardtongue is a locally endemic species in three widely disjunct locations in California, Nevada, and Arizona. Most of its California geographic range is within the BLM Pisgah ACEC. In Nevada, it is

known only from several populations southeast of the I 15 Freeway, between Stateline and Las Vegas. These occurrences are threatened by a proposed new construction project. In Arizona, white-margined beardtongue occurs at Dutch Flat, east or southeast of Needles. In Arizona, as in California, it is regarded it is "a rare species throughout its range" by the Arizona Rare Plant Committee.

White-margined beardtongue is present at several locations on the CSP site and numerous other occurrences off-site to the southeast on lands managed by BLM in the Pisgah ACEC. It appears to require several years of above-average rainfall to become established from seed, and cross-sections of stem bases suggest that individual plants may survive for several decades. There is no known feasible horticultural method to propagate white-margined beardtongue. Due to varying habitat and rainfall, white-margined beardtongue may exist as "metapopulations," where local occurrences are extirpated by poor conditions but are replaced by new occurrences when seedlings become established at new sites during favorable conditions. In future years, white-margined beardtongue may have the potential to occur anywhere in the lower elevation wash and sandfield vegetation on the Calico project site. (Ex. 300, pp. C.2-30 – C.2-31.)

Coves' Cassia (Senna covesii =Cassia covesii)

Coves' cassia, a CNPS List 2.2 species, occurs in scattered California locations along the desert margin of the Peninsular ranges, interior desert ranges in Riverside County, and in extreme southeastern San Bernardino County. It is more common and widespread in Arizona and Baja California, and also occurs in Nevada and mainland Mexico. It occurs in desert washes, below about 2000 ft. elevation. It is a low shrub with velvety leaves and stems which distinguish it from the more common Cassia armata. The flowers are yellow, appearing in spring in racemes of few flowers each. Though Coves' cassia was reported in 2009 surveys of the project site, the plant locations are not mapped and there is no indication of numbers of plants or the extent of distribution across the project site. If valid, that report would be the first record of Coves' cassia in the central Mojave Desert. It was not found during the 2010 survey. Staff concluded, and we therefore find, that the original report was due to misidentification. Coves' cassia is unlikely to occur on the project site. (Ex. 300, p. C.2-31.)

Small-Flowered Sand-Verbena (Tripterocalyx micranthus)

This CNPS List 2.3 species is a taprooted perennial herb of desert dunes and sandy sites. It occurs in the eastern California deserts (where it has been

reported from only two locations), eastward to the Rocky Mountain States. Its elevational range is approximately 1,800 to 2,800 feet. The only reliable prior reports in California are from the Kelso area and Eureka Valley in Inyo County. Small-flowered sand-verbena was reported in 2009 surveys of CSP site, though, as for Coves' cassia, above, the locations were not mapped, nor was there an indication of numbers of plants or extent of distribution across the project site. If valid, this report would be the first record of small-flowered sand-verbena in the central Mojave Desert. It was not found during the 2010 survey. We agree with Staff's assertion that small-flowered sand verbena is unlikely to occur on the project site. (Ex. 300, p. C.2-32.)

b. Birds

Western Burrowing Owl (Athene cunicularia)

The burrowing owl is a small, terrestrial owl of open country. Burrowing owls favor flat, open grassland or gentle slopes and sparse shrubland ecosystems. These owls prefer annual and perennial grasslands, typically with sparse, or nonexistent, tree or shrub canopies. In California, burrowing owls are found in close association with California ground squirrels. Owls use the burrows of ground squirrels and other rodents for shelter and nesting. Ground squirrels provide nesting and refuge burrows, and maintain areas of short vegetation height, which provide foraging habitat and allow for visual detection of avian predators by burrowing owls. Habitats lacking ground squirrel populations are usually unsuitable for occupancy by owls, although owls can also use man-made features as burrows (such as drain pipes, debris piles, etc). Burrowing owls are semi-colonial nesters, and group size is one of the most significant factors contributing to site constancy by breeding burrowing owls. The nesting season, as recognized by the California Burrowing Owl Consortium, runs from 1 February through 31 August.

In the Mojave Desert, burrowing owls generally occur at low densities in scattered populations, but they can be found in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant (Gervais et al. 2008). The project area contains suitable foraging habitat and California ground squirrel burrows that could provide breeding habitat. This species is present on the project site, as one individual was observed in the north-central portion of the project site and another individual was observed in the Pisgah ACEC adjacent to the southeast of the project site during field surveys in 2008. Protocol surveys for this species were conducted in January

2010, and two burrowing owls and eleven burrows with sign were identified approximately 0.5 miles north of the project boundary near the toe of the Cady Mountains. (Ex. 300, pp. C.2-36 – C.2-37.)

Swainson's Hawk (Buteo swainsoni)

The Swainson's hawk was once one of the most common birds of prey in the grasslands of California and nested in the majority of the lowland areas of the state. Currently, the nesting range is primarily restricted to portions of the Sacramento and San Joaquin valleys, northeast California, and the Western Mojave, including the Antelope Valley. The Swainson's hawk requires large amounts of foraging habitat, preferably grassland or pasture habitats. Its preferred prey includes voles (Microtus spp.), gophers, birds, and insects such as grasshoppers. It has adapted to the use of some croplands, particularly alfalfa, as well as grain, tomatoes, and beets. Crops such as cotton, corn, rice, orchards, and vineyards are not suitable because they either lack suitable prey, or prey is unavailable to the hawks due to crop structure. Swainson's hawks often establish territories in riparian systems adjacent to suitable foraging habitats as well as utilizing lone trees or groves of trees in agricultural fields.

Within the West Mojave Plan area, the nearest documented nesting attempts have been recorded in Victorville, approximately 50 miles southwest of the project site; nesting is not known from east of this location within the planning area. Two Swainson's hawks were observed by the applicant during project surveys on March 30, 2008; thus the species is considered present within the project area, though it is not expected to nest there. (Ex. 300, p. C.2-37.)

Prairie Falcon (Falco mexicanus)

Prairie falcons breed throughout California, with the exception of the northwest corner and along the immediate coast. This species is an uncommon resident that ranges from the southeastern deserts northwest through the Central Valley and along the inner Coast Ranges and Sierra Nevada. It is primarily associated with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas. Prairie falcons were observed on the project site during surveys conducted in 2010 and in off-site areas during helicopter surveys for golden eagles. Nesting habitat for this species does not occur onsite; however, suitable foraging habitat for this species occurs within the project site. This species likely nests in the nearby Cady Mountains. Thus, the potential for

occurrence of this species within the project area has been determined to be high, though it is not expected to nest there. (Ex. 300, p. C.2-37.)

Golden Eagle (Aquila chrysaetos)

Golden eagles are typically year-round residents throughout most of their western United States range. They breed from late January through August with peak activity March through July. Migratory patterns are usually fairly local in California where adults are relatively sedentary, but dispersing juveniles sometimes migrate south in the fall. This species is generally considered to be more common in southern California than in the northern part of the state.
Habitats for this species typically include rolling foothills, mountain areas, and deserts. Golden eagles need open terrain for hunting and prefer grasslands, deserts, savanna, and early successional stages of forest and shrub habitats. Golden eagles primarily prey on lagomorphs and rodents but will also take other mammals, birds, reptiles, and some carrion. This species prefers to nest in rugged, open habitats with canyons and escarpments, with overhanging ledges and cliffs and large trees used as cover.

Absent interference from humans, breeding density is determined by either prey density or nest site availability, depending upon which is more limiting (USFWS 2009a). U.S. Fish and Wildlife Service recommendations include a 0.5 mile nest protection buffer and evaluating an area of 4 miles from nests as foraging habitat.

Golden eagles were observed flying over the project site during both the 2007 and 2008 surveys conducted by the applicant. Staff also observed a golden eagle above the project site during a reconnaissance survey conducted on May 25, 2010. This species is considered present within the project area and nesting was documented by the applicant in the vicinity of the project (within a 10 mile buffer area). Nesting habitat does not occur onsite, and the observed birds likely nest in the nearby Cady Mountains and forage over the project area. Information provided by the BLM and the applicant indicate that up to six potential nesting sites occur within a 10 mile radius of the site. To document potential nest sites for golden eagles, the applicant conducted helicopter surveys for this species on March 11th and 12th, 2010. This survey detected approximately 22 stick nests including eight inactive, but potential golden eagle nests, and one active nest that contained an incubating adult golden eagle. The active nest is located approximately 3.5 miles east of the proposed project area. (Ex. 300, pp. C.2-37 – C.2-38.)

Loggerhead Shrike (Lanius ludovicianus)

Loggerhead shrikes are uncommon residents throughout most of the southern portion of their range, including southern California. In southern California they are generally much more common in interior desert regions than along the coast. In the Mojave Desert this species appears to be most numerous in flat or gently sloping deserts and desert/scrub edges, especially along the eastern slopes of mountainous areas (Humple 2008). Loggerhead shrikes initiate their breeding season in February and may continue with raising a second brood as late as July; they often re-nest if their first nest fails or to raise a second brood.

This species can be found within lowland, open habitat types, including creosote scrub and other desert habitats, sage scrub, non-native grasslands, chaparral, riparian, croplands, and areas characterized by open scattered trees and shrubs. Fences, posts, or other potential perches are typically present. In general, loggerhead shrikes prey upon large insects, small birds, amphibians, reptiles, and small rodents over open ground within areas of short vegetation, usually impaling prey on thorns, wire barbs, or sharp twigs to cache for later feeding.

Suitable habitat for loggerhead shrike occurs throughout the scrub habitats within the project area and loggerhead shrikes were observed in the project area between the BNSF Railroad and the I 40 during the 2008 surveys and near the BNSF railroad during the 2010 surveys. Thus, this species is considered present, and it likely nests and forages onsite. (Ex. 300, pp. C.2-38 – C.2-39.)

Bendire's Thrasher (Toxostoma bendirei)

Bendire's thrashers are known in California from scattered locations in Kern, Inyo, San Bernardino, and Riverside Counties, and one documented outlier in San Diego County. This species is a summer resident in California from March to late August, breeds from late March through July, and departs by mid- to late August. In the Mojave Desert, this species favors Mojave desert scrub, primarily in areas that contain large cholla, Joshua tree, Spanish bayonet, Mojave yucca, or other succulents. The status of populations of this species is poorly understood, but threats are believed to be loss of habitat due to urbanization and agricultural development, harvesting of yuccas and cholla cacti, and off-road vehicle activity.

Bendire's thrasher is present on the project site, as this species was observed during surveys in an area adjacent to the project site, and suitable nesting and foraging habitat occurs throughout the project area. (Ex. 300, p. C.2-39.)

Le Conte's Thrasher (Toxostoma lecontei)

This species inhabits some of the hottest and driest habitats in the arid southwest, including the deserts of southeastern California where they occur year-round. Preferred habitats include sparse desert scrub, alkali desert scrub, and desert succulent scrub habitats with open desert washes. They seek gentle to rolling slopes associated with dry desert washes, conditions found on alluvial fans that are found in the project area. Nests are typically placed in prickly vegetation such as cacti or thorny shrubs. The Le Conte's thrasher population densities are among the lowest of passerine (perching) birds, estimated at less than five birds per square kilometer in optimal habitats. This low population density decreases the probability of their detection during field surveys. The population decline is due in part to the conversion of habitat to agriculture and urbanization. Le Conte's thrashers are also affected by off-highway use during nesting season, which occurs on numerous unimproved roads throughout the project site. This species requires areas with an accumulated leaf litter under most plants as cover for its preferred arthropod prey; they also feed on seeds, insects, small lizards, and other small vertebrates.

Le Conte's thrasher is present on the project site. One individual was observed within the project boundary during the 2008 surveys, and three were observed in 2010. This species may nest and forage on the project site. (Ex. 300, p. C.2-39.)

c. Mammals

Nelson's Bighorn Sheep (Ovis canadensis nelsoni)

Bighorn sheep are typically found on open, rocky, steep areas used for escape cover and shelter, with available water and herbaceous vegetation for forage. Bighorn sheep are agile in steep, rocky terrain, allowing them to escape predators such as coyotes (Canis latrans), golden eagles (Aquila chrysaetos), and cougars (Felis concolor). Most of the bighorn sheep live between 300–4,000 feet in elevation where the annual precipitation is less than 4 inches and daily high temperatures average 104°F in the summer.

Bighorn sheep primarily browse shrubs and graze on native grasses throughout the year. The pulp and fruits of various cacti are eaten during the dry season. Bighorn sheep have a large rumen, relative to body size, which allows digestion of grasses, even in a dry state. This gives them flexibility to select diets that optimize nutrient content from available forage. Consequently, bighorn sheep feed on a large variety of plant species and diet composition varies seasonally and among locations. While diet quality varies greatly among years, it is most predictably high in late winter and spring, and this period coincides with the peak of lambing. The lambing season of Nelson's bighorn sheep in the Mojave Desert is typically between December and June.

Surface water is another element of desert bighorn habitat considered important to population health. Bighorn sheep congregate near dependable water sources from May through October. These population aggregations during this period are due to a combination of breeding activities and diminishing water sources. It is common for males and females to segregate and occupy different habitats outside the breeding season. Females tend to choose particularly steep, safe areas for bearing and initial rearing of lambs. Areas associated with ridge benches or canyon rims adjacent to steep slopes or escarpments are commonly preferred lambing areas if available. Males frequently occupy much less precipitous habitat during the lamb-rearing season. Alluvial fan areas are also used for breeding and feeding activities.

The population of bighorn sheep in the Cady Mountains just north of the project area is a native population (not reintroduced or augmented), and was estimated to contain approximately 25 to 50 individuals in 1995. By 2007, this population had grown to approximately 300 individuals. No Nelson's bighorn sheep were observed during the 2007 or 2008 Calico Solar Project surveys; however, surveys conducted by helicopter in March 2010 observed 62 bighorn sheep (12 rams, 38 ewes, and 12 lambs) within 10 miles of the project site. In addition, two bighorn sheep horns, two bighorn sheep skeletons and one occurrence of bighorn sheep scat were detected during surveys conducted for desert tortoises and botanical resources between April 5 and April 15, 2010. These occurrences were observed north of the project detention basins between the Cady Mountains and the proposed project. In addition, staff observed bighorn sheep scat on the top of one of the large volcanic rock outcroppings that occur adjacent to the proposed detention basin at the north boundary of the project. It is likely that bighorn sheep use portions of the site for foraging and possibly inter-mountain movement to some degree. (Ex. 300, p. C.2-40.)

Pallid Bat (Antrozous pallidus)

The pallid bat is a light brown or sandy colored, long-eared, moderate-sized bat that occurs throughout California with the exception of the northwest corner of the state and the high Sierra Nevada. Pallid bats are most commonly found in oak savannah and in open dry habitats with rocky areas, trees, buildings, or bridges for roosting. Coastal colonies commonly roost in deep crevices in rocky outcroppings, in buildings, under bridges, and in the crevices, hollows, and exfoliating bark of trees. Colonies can range from a few individuals to over a hundred. Usually this species occurs in groups larger than 20 individuals. Although crevices are important for day roosts, night roosts often include open buildings, porches, garages, highway bridges, and mines. Pallid bats may travel up to several miles for water or foraging sites if roosting sites are limited. This bat prefers foraging on terrestrial arthropods in open habitats and regional populations and individuals may show selective prey preferences. They may also occur in open coniferous forests. Pallid bat roosts are very susceptible to human disturbance, and urban development has been cited as the most significant factor contributing to their regional decline. Although roosting habitat does not appear to exist onsite, there is a moderate potential for pallid bats to forage over the entire project area. Roosting habitat occurs nearby in the Cady Mountains and lava tubes associated with the Pisgah Crater. (Ex. 300, p. C.2-41.)

Townsend's Big-Eared Bat (Corynorhinus townsendii)

The Townsend's big-eared bat is a colonial species that feeds primarily on moths and other soft-bodied insects. Females aggregate in the spring at nursery sites known as maternity colonies. Although the Townsend's big-eared bat is usually a cave-dwelling species, many colonies are found in anthropogenic structures such as the attics of buildings or old, abandoned mines. Roost sites in California include limestone caves, lava tubes, mine tunnels, buildings, and other structures. Radiotracking studies suggest that movement from a colonial roost during the maternity season is confined to within 9 miles of the nursery. Townsend's big-eared bats are very susceptible to human disturbance, and females are known to completely abandon their young when disturbed. The loss of maternity and hibernation roosts has been cited as the most significant factor contributing to their decline throughout their range. In Southern California, Townsend's big-eared bat was once common in the coastal plains of Southern California where mines or caves were prevalent. However, this species has declined substantially in the region and is now primarily limited to the foothill and mountain regions of Southern California. Townsend's big-eared bat was detected

onsite during surveys in 2008. Although roosting habitat does not appear to exist onsite, Townsend's big-eared bats are expected to forage over the entire project area. Roosting habitat occurs nearby in the Cady Mountains and lava tubes associated with the Pisgah Crater. (Ex. 300, p. C.2-41.)

American Badger (Taxidea taxus)

American badgers were once fairly widespread throughout open grassland habitats of California. They are now uncommon, permanent residents throughout most of the state, with the exception of the northern North Coast area. Known to occur in the Mojave Desert, they are most abundant in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. In the southwest, badgers are typically associated with Mojave creosote bush scrub and sagebrush. Mating occurs in late summer or early fall and two to three young are born in March or April. Badgers are fossorial, digging large burrows in dry, friable soils and will use multiple dens/cover burrows within their home range. They typically use a different den every day, although they can use a den for a few days at a time. Cover burrows are an average of 30 feet in length and are approximately 3 feet in depth. Natal dens are larger and more complex than cover dens. In undisturbed, high-quality habitat, badger dens can average 0.64 dens per acre, but are usually at much lower density in highly disturbed areas.

American badger is present within the project area, and three burrows were detected in 2010. Suitable foraging habitat and prey items for this species are broadly distributed across the project site. (Ex. 300, p. C.2-42.)

Desert Kit Fox (Vulpes macrotis arsipus)

The desert kit fox can be found in much of the same habitat as the badger in the Mojave Desert. While the desert kit fox is not listed as a special-status species by the State of California or the USFWS, it is protected under Title 14, California Code of Regulations (Title 14, Section 460) from trapping and hunting. Kit foxes are primarily nocturnal, and inhabit open level areas with patchy shrubs. Friable soils are necessary for the construction of dens, which are used throughout the year for cover, thermoregulation, water conservation, and rearing pups. Kit foxes typically produce one litter of about four pups per year, with most pups born February through April. Desert kit fox is present within the project site, as this species was detected onsite during surveys. Surveys conducted by the applicant for burrowing owls detected approximately 36 potential kit fox dens within the proposed project area. (Ex. 300, p. C.2-42.)

d. Reptiles

Desert Tortoise (Gopherus agassizii)

The desert tortoise is an herbivore that may attain a carapace (shell) length of 9 to 15 inches. The tortoise is able to live where ground temperature may exceed 140° F because of its ability to dig burrows and escape intense solar radiation. At least 95% of its life is spent in burrows. The tortoise enters brumation (the reptilian form of hibernation) during the period from September to November and leaves the burrow during the period from February to April. In the spring this species becomes most active above ground from March through May when foraging opportunities are optimal. Tortoises remain active — though to a lesser extent — between June and October. During the active period in the warmer months of the year, tortoises retreat to burrows during periods of intense heat, to rest at night, and to aestivate during extended periods of heat and dryness. Tortoises may also utilize shady areas underneath bushes or rocks during the hottest parts of the day. A single tortoise may have a dozen or more burrows within its home range, and different tortoises may use these burrows at different times.

Range wide, occupied habitats include desert alluvial fans, washes, canyon bottoms, rocky hillsides, and other steep terrain. Tortoises are most common in desert scrub, desert wash, and Joshua tree habitats, but occur in almost every desert habitat except on the most precipitous slopes. Friable soils, such as sand and fine gravel, are an important habitat component, particularly for burrow excavation and nesting. The presence of soil suitable for digging burrows is a limiting factor to desert tortoise distribution.

Plant species play a major role in defining desert tortoise habitat. Creosote bush, burrobush (Ambrosia dumosa), Mojave yucca (Yucca schidigera), and blackbrush (Coleogyne ramosissima) generally distinguish desert tortoise habitat. At higher elevations, Joshua tree and galleta grass are common plant indicators.

The desert tortoise's range includes the Mojave Desert region of Nevada, southern California, and the southwest corner of Utah and the Sonoran Desert region of Arizona and northern Mexico. The desert tortoise range is divided into Mojave and Sonoran populations. The desert tortoise in the vicinity of the Calico Solar Project is part of the Mojave population, which is primarily found in creosote bush-dominated valleys with adequate annual forbs for forage.

Desert tortoises occur in the project area and are broadly distributed across the proposed project site. Most of the desert tortoises detected during project surveys were noted north of the BNSF railroad, primarily in the bajada near the toe of the Cady Mountains. This area contains good quality habitat for desert tortoise and has less obstructed connectivity to adjacent natural lands. The area between the BNSF railroad and I 40 is isolated by the highway and railroad and portions of the site have been subject to repeated disturbance from pipeline development. Nonetheless, two tortoises were detected in this area and tortoise sign was observed in low density near the center of this area by staff and the applicant. While the railroad poses a substantial barrier to movement, access is available through the many railroad trestles that span the drainages that flow across the site.

The results of the 2010 protocol surveys conducted by the Applicant detected 104 tortoises (adult, subadult and juvenile) within the original 8,230-acre project footprint. In response to staff and agency feedback, the applicant reduced the project footprint to minimize impacts to desert tortoise linkages. The original redesigned 6,215-acre project footprint consisted of approximately fifty-seven (57) tortoises. Subsequent to the committee order, the project was reduced further to 4,614 acres in Scenario 5.5. The applicant detected 10 tortoises on this reduced acreage alternative. (EX. 317, p. C.2-4.) **Biological Resources Figure 3** shows the locations of desert tortoises detected during the 2010 surveys.

The nearest designated critical habitat for this species is located approximately 0.5 mile south of the project site within the Ord-Rodman Desert Wildlife Management Area (DWMA). Interstate 40 and the BNSF Railroad pose barriers to movement between that critical habitat and the Calico Solar Project area. (Ex. 300, pp. C.2-32 – C.2-33.)

Banded Gila Monster (Heloderma suspectum cinctum)

The banded gila monster is considered rare in California with only 26 credible records of the species documented within the past 153. This large and distinct lizard is difficult to observe even in areas where they have been recently recorded. As a result, little is known about this species' distribution, population status, and life history in California. Most of the historical observations in California occurred in mountainous areas of moderate elevations with rocky, incised topography, in large and relatively high ranges as well as riparian areas. Despite the widespread distribution of potential habitat throughout the California

desert, the few documented observations suggest the California populations may be confined to the eastern portion of the California desert, and the current distribution is apparently a function of summer rainfall. All California gila monster observations except one (Mojave River) occurred east of the 116° longitude in areas that received at least 25 percent of their annual precipitation during the summer months. Throughout their range, gila monsters appear to be most active during or following summer rain events.

Banded gila monsters were not detected onsite during surveys and the project is avoiding many of the rocky outcrops and lava flows present onsite that could provide habitat. Although this species is not known from the area and the closest known sighting is an historic record from the Providence Mountains approximately 50 miles to the east of the project site, this species is difficult to detect due to its secretive nature and tendency to remain in underground burrows for extended periods of time. Therefore, there is a low potential for this species to inhabit the project area. (Ex. 300, pp. C.2-33 – C.2-34.)

Mojave Fringe-Toed Lizard (Uma scoparia)

Mojave fringe-toed lizards are known almost exclusively from California, primarily in San Bernardino and eastern Riverside Counties, but are also found to the north in southeastern Inyo County and historically to the west in eastern Los Angeles County.

The Mojave fringe-toed lizard is a BLM sensitive species that is found in arid, sandy, sparsely vegetated habitats, within the broader matrix of creosote bush scrub, throughout much of its range. It is restricted to habitats where fine, loose, aeolian sand is available. It burrows in the sand to avoid predators and to thermoregulate, though it will also seek shelter in rodent burrows. Sand dunes provide its primary habitat, although it can also be found in the margins of dry lakebeds, washes, and isolated sand habitat, such as scattered hummocks or wind-deposited “sand ramps” against hillsides.

The Mojave fringe-toed lizard is primarily insectivorous, but also eats plant food including leaves, seeds, and buds (Stebbins 1944). It normally hibernates from November to February, and emerges from hibernacula from March to April. The breeding season is April to July, and adult Mojave fringe-toed lizards reach sexual maturity two summers after hatching. Common predators include burrowing owls, leopard lizards, badgers, loggerhead shrikes, roadrunners, various snakes, and coyotes.

The Mojave fringe-toed lizard is widespread geographically across the Mojave and northern Colorado deserts, but its distribution is highly fragmented because it is restricted to habitats containing loose sand, which is patchily distributed. Many local populations occur on small or isolated patches of sand and are quite small. This fragmented pattern of distribution leaves the species vulnerable to local extirpations from additional habitat disturbance and fragmentation as well as random events. The loose wind-blown sand habitat, upon which the Mojave fringe-toed lizard is dependent, is a fragile ecosystem requiring the protection against both direct and indirect disturbances. Environmental changes that stabilize sand, affect sand sources, or block sand movement corridors will also affect this species. Aside from the direct loss of land, development can also affect Mojave fringe-toed lizards by increasing access by predators, such as the common raven and small raptors, to their habitat. Raven numbers tend to increase around developed facilities due to increased availability of water and trash; other predators may increase in numbers due to availability of new perch sites (e.g., fence posts, sign posts, structures) which allow them to hunt for lizards in areas where no perches were previously available. Potential indirect disturbances are associated with the disruption of the dune ecosystem source sand, wind transport, and sand transport corridors.

The applicant reported that the Mojave fringe-toed lizard is present on the Calico Solar Project site, and identified a partially stabilized dune complex located between the BNSF Railroad and I 40, approximately 16.9 acres, as Mojave fringe-toed lizard habitat. Staff conducted reconnaissance surveys of the site in January and May 2010, during which times staff inspected the dune complex and adjacent habitats. Four Mojave fringe-toed lizards were detected by staff during the May surveys. These included one lizard within the dune area identified by the applicant; one in soft windblown sand along the large primary drainage west of the delineated habitat; and two in fine accumulated sands on the vegetated windrow that borders the north side of the BNSF railroad. Mojave fringe-toed lizard was also detected along a wash north of the BNSF railroad during the applicant’s 2010 desert tortoise surveys. Fine-grained friable sand occurs in many other areas adjacent to the identified dune complex, both within the numerous drainages that cross the project site and in small patches of windblown sand. Similarly, soft friable sands with small patches of micro dunes occur within the creosote bush scrub habitat across much of the lower project site. In Staff’s opinion, it is likely that Mojave fringe-toed lizard occurs in low densities across much of the project site south of the BNSR railroad and within and around soft sands associated with the drainages north of the BNSF railroad.

Staff calculated the amount of Mojave fringe-toed lizard habitat on the project site by adding the additional habitat it identified to the 16.9 acres identified by the applicant and adding a 45-meter surrounding buffer area to account for species traveling away from its primary habitat, yielding 164.7 acres of suitable habitat. (Ex. 300, pp. C.2-34 – C.2-36.)

4. Direct and Indirect Impacts and Mitigation

The CEQA Guidelines define direct impacts as those impacts that result from the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance while still reasonably foreseeable and related to the project. The potential impacts we consider here are those most likely to be associated with construction and operation of the project.

Impacts of the proposed project or alternatives would be considered significant and would require mitigation if the project would:

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the BLM, CDFG, or USFWS.
- Have an adverse effect, either directly or through habitat modifications, on any species listed as endangered, threatened, or proposed for listing or critical habitat for these species.
- Have a substantial adverse effect, either directly or through habitat modifications on any species identified as a candidate for listing, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG, BLM, or USFWS.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances.

- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, Federal, or State HCP. (CEQA Guidelines, (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000 et. seq, Appendix G, Environmental Checklist Form)

White-margined beardtongue, Coves' cassia, and small-flowered sand verbena are not listed under the California or federal Endangered Species Acts. However, under significance criteria adopted by staff in the Supplemental Staff Assessment (see Section C.2.3), project impacts to these species, if not mitigated, will be considered significant pursuant to CEQA. The Energy Commission and other State agencies such as CDFG, have a history of requiring mitigation for impacts to special-status plants such as these. Under Section 15380 of the CEQA guidelines, a species may be considered endangered, rare or threatened, if it can be shown to meet the criteria for State or federal listing.

The California Native Plant Society (CNPS) cooperates under a memorandum of understanding with CDFG to identify which plants may be rare or threatened, evaluate threats to them, share occurrence data, and plan protective measures. In this role, CNPS evaluates plant taxa according to abundance, distribution, and threats, and it ranks rare species on a series of lists. The joint CNPS Rare Plant Program and CDFG's CNDDB Plant Status Review Process for CNPS List and CDFG Special Plants List status is a rigorous review process that evaluates existing literature, reviews herbarium collections, and communicates with experts before making a recommendation for listing. A summary of information on each candidate taxon is reviewed by a network of California botanists, representing State and federal agencies, environmental consulting firms, academic institutions, CNPS, and other conservation organizations.

All of the CNPS List 1B and List 2 plants potentially occurring in the project area are also included in the CDFG Special Plants List and are tracked by CDFG's CNDDB. The CNPS Inventory has been a broadly recognized and accepted source of science-based information on the rarity, endangerment, and distribution of California special-status plants since its first edition in 1974. The Energy Commission's regulations refer to CNPS Lists in the definition of "species of special concern" (California Code of Regulations, Title 20, section 1702 (q) and (v)), and the BLM has a policy of designating all CNPS List 1B plants, unless specifically excluded by the BLM State Director, as BLM Sensitive. By CNPS's standards, the plants on CNPS Lists 1A, 1B and 2 meet the definitions of Sections 2062 and 2067 (CESA) of the California Fish and Game Code, and are eligible for State listing. The Energy Commission considers those plants

appearing on CNPS List 1B or 2 to be potentially eligible, and evaluates project impacts to each one known from the site, as explained below. (Ex. 300, pp. C.2-56 – C.2-57.)

a. Construction Impacts

Construction of the Calico Solar Project would result in the permanent land use conversion of native vegetation communities and the loss of special-status plant and animal species and their habitat. Permanent loss as defined by staff involves impacts that would not recover within 5 years (above). The Calico Solar Project would have long-term impacts associated with project features (e.g., SunCatchers, expansion of the Pisgah Substatin, new transmission line towers, new access roads, altered drainage features, evaporation ponds, and required maintenance activities that would routinely disturb wildlife and vegetation) that would continue throughout the life of the project, as well as habitat degradation that would persist for decades following project closure.

Vegetation

Construction of the Calico Solar Project and associated facilities would result in the permanent loss of native vegetation from the construction of new access roads, SunCatcher footings, stormwater facilities, and various appurtenant structures to support the project. In addition, the project would result in disturbance to vegetation from mowing. The applicant indicated that prior to SunCatcher installation, the SunCatcher Array area will be mowed to about 3 inches. During SunCatcher operation, if vegetation within the path of SunCatcher movement reaches a height of 8 inches, it will likely be re-mowed to 3 inches. The applicant indicates that re-mowing treatment would be applied to about 5% of the SunCatcher array area. Vegetation not within the path of SunCatcher movement or within the access road footprints would be allowed to re-generate. Mowing is a permanent impact to native vegetation as mowing would likely result in type conversion of re-mowed areas from creosote bush scrub to more herbaceous vegetation, and degradation of untreated or once-treated vegetation by introduction of new edge effects to remnant desert shrubland throughout the proposed project site.

Direct mortality to vegetation could occur from construction activities that remove vegetation, grade soils, or cause sedimentation or erosion. Clearing and grading may also result in the alteration of soil conditions, including the loss of native seed banks and changes to the topography and drainage of a site such that the

capability of the habitat to support native vegetation is impaired. Indirect effects could include soil compaction, disruption of the native seed bank, increased dust, sediment transport, or colonization by invasive non-native species. These actions may result in reduced habitat quality for upland plants. In addition, the removal of vegetation cover and the disruption of soil crusts create possibilities for erosion, dust, and weed invasion that can affect habitat in adjacent areas.

The vegetation present on the Calico Solar project site supports a diversity of common and sensitive wildlife. The loss of existing vegetation and expected level of disturbance from weeds and human disturbance (described below) will alter the functional use of the remaining habitat. These direct and indirect construction impacts to vegetation, unless mitigated, would be significant under CEQA.

Weeds, include species of non-native, invasive plants included on the weed lists of the California Department of Food and Agriculture, the California Invasive Plant Council, or federally listed noxious weeds. The spread of invasive plants is a major threat to biological resources in the Mojave Desert because these invasive non-native plants can displace native plants, increase the threat of wildfire, supplant wildlife foods that are important to herbivorous species, alter the habitat structure and ecological function of wetland, riparian, and desert wash communities, and invade or threaten special-status plant occurrences and habitat.

Invasive plants, noxious weeds, and other invasive species on BLM lands will be prevented, controlled, treated, and restored through an Integrated Pest Management approach per the Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States, and the 2009 National Invasive Species Management Plan.

Construction activities and soil disturbance tend to introduce non-native invasive plant species into new areas and to facilitate their proliferation and spread. New introductions occur when seed are inadvertently introduced to a site, most often with mulch, hay bales, or wattles used for erosion control, or when they are transported on construction equipment or their tires from off-site areas. Many invasive non-native species are adapted to and promoted by soil disturbance. Once introduced, they can out-compete native species because of minimal water requirements, high germination potential and high seed production; can outcompete native annuals where nitrogen deposition (near major highways such as I 40) and precipitation rates are higher, leading to higher risk of wildfire, and can become locally dominant, representing a serious threat to native desert

ecosystems. Invasive weeds generally spread most readily in disturbed, graded, or cultivated soils, including disturbance by construction equipment. Thus, the proposed Calico Solar project, including the solar generator construction and associated Transmission line and other facilities, could introduce or facilitate the spread of invasive non-native plants. Without control, weeds already present in the area would increase their abundance in soils disturbed by project construction throughout the project site and along the linear facilities, especially where nitrogen deposition is an issue, and that construction equipment could accidentally import new invasive species from off-site.

Undisturbed desert habitat has been less vulnerable to invasion by weedy species and only a limited suite of invasive non-native plant species are capable of invading natural desert areas. The hot and arid environment, undependable timing and amount of annual precipitation, and often saline or alkaline soils limit the range of invasive species capable of naturalization in desert areas. However, certain aspects of the proposed project would change those conditions, creating habitat more suited to a wider variety of invasive plants and to greater abundance of the invasive species already present in the area. Initial mowing and construction disturbance will disrupt soil conditions that favor the colonization by weedy species. Shade beneath the SunCatchers would then alter the micro-environments, favoring weedy ephemerals. Studies conducted in the Sonoran and Mojave Deserts have demonstrated that shading resulted in a cooler, moister microhabitat below and near structures. Shading and wind deflection caused by the structures decrease soil temperature extremes and decrease evaporation from soil surfaces. The addition of water from regular mirror washing also increases the humidity of the microhabitat around the solar structures. This change from the normal arid desert environment does not favor the native arid-adapted species and allows the weedy ephemerals to colonize.

Numerous invasive non-native weeds have already become widespread throughout the Mojave Desert and for some invasive species the prevention of further spread is impracticable. Examples of these species include red brome, cheat grass, Mediterranean grass, red-stemmed filaree, and Russian thistle. Other invasive species, particularly Sahara mustard, can substantially alter native habitats if left uncontrolled, but to date, have not become pervasive within or adjacent to the project area. Still others (e.g., saltcedar, Tamarix ramosissima) are damaging to specific habitat types but pose little or no threat to widespread upland desert habitat.

b. Mitigation

The above impacts are reduced to less-than-significant levels with implementation of impact avoidance and minimization measures described in Conditions of Certification **BIO-1** through **BIO-31**. Those mitigation measures are summarized in Biological Resources Table 2, below.

Biological Resources Table 2
Biological Resources Mitigation Measures

Mitigation Measure	***Provisions for Scenario 5.5 site***	***Mitigation/Impacts***
BIO 1	Project Owner must assign at least one Designated Biologist, possessing specified qualifications	Facilitates monitoring compliance with the Biological Resources Conditions of Certification; specified qualifications assure the ability of the individual to properly perform her duties
BIO 2	Designated Biologists duties include advising project owner's agents and employees on implementing the Conditions of Certification; mark and periodically inspect sensitive areas, inspect for trapped animals; monitor compliance with conditions; maintain records of tasks, including those in BRMIMP, below;	Further facilitates compliance with the Conditions
BIO 3	Sets forth Biological Monitor qualifications	Specified qualifications assure the ability of the individual to properly perform her duties
BIO 4	Biological Monitor duties include assisting the Designated Biologist in conducting surveys and monitoring construction activities	Further facilitates compliance with the Conditions
BIO 5	Designated Biologist and Biological Monitor have the authority to halt activity in an area if unauthorized	Protects from unexpected or impacts to biological resources
BIO 6	Requires Worker Environmental Awareness Program (WEAP) training for all onsite employees	Assists workers in avoiding impacts to biological resources by training them to spot the resources and explaining why and how they can protect them
BIO 7	Project owner must prepare a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), incorporating	Consolidates measures, conditions and other information in a single place to facilitate compliance with the requirements applicable to the project

	avoidance and minimization measures from various other required plans; containing maps depicting the locations of sensitive resources; state and federal conditions; descriptions of monitoring methodologies and frequencies; mitigation performance standards and remedial measures if those standards are not met	
BIO 8	Specifies impact avoidance and minimization measures regarding disturbance areas, perimeter fencing, roads, traffic, juvenile desert tortoise and other wildlife entrapment, minimize standing water and dispose of road kill	These measures avoid injuries to sensitive species and encouraging predators (ravens, etc.) to visit the area, thereby protecting tortoises
BIO 9	Project owner must allow access to site for inspections ; Designated Biologist must monitor grading, make daily checks of tortoise exclusion; provides an annual and final(when operation begins) Listed Species Status Report	Assists in assuring compliance with Construction Facilitates verification of compliance with Conditions
BIO 10	Project owner must prepare a Revegetation Plan for areas of temporary disturbance and restore those areas according to the approved plan. Minimum Plan requirements are specified	Assures the revegetation of the temporarily disturbed lands
BIO 11	Project owner must prepare a Weed Management Plan. Minimum Plan requirements are specified	Provides for the taming of invasive weeds to protect sensitive plants from invasive weeds
BIO 12	A lengthy condition containing, among other features measures to protect; guidelines for conducting summer-fall special status plant surveys, mitigation	Reduces potential impacts to special status plants to insignificance

	requirements for plants found in the survey; off-site compensatory mitigation; measures to obtain nursery stock	
BIO 13	Requires compensatory habitat, estimated at approximately 208 acres, to mitigate for loss of Mojave fringe-toed lizard habitat on the project site	Mitigates for the loss of habitat on the project site by purchasing and protecting suitable off site habitat lands
BIO 14	Requires preconstruction surveys for Gila Monsters and removal and relocation of any individuals that are found	Relocating the Gila monsters protects them from injury due to activities on the project site.
BIO 15	Specifies requirements for desert tortoise surveys, exclusion fences, tortoise handling and other matters relating to the removal for tortoise from the project site.	Protects tortoise during the process of clearing the project site.
BIO 16	Requires a Desert Tortoise Translocation Plan, compliant with recently revised guidelines from the US Department of Fish and Game's Tortoise Recovery Office	Provides for the protection of tortoise to be relocated and tortoise occupying the relocation sites. By testing the health of each, transmission of disease will be minimized
BIO 17	Requires compensatory habitat, estimated at 10,302 acres, to mitigate for loss of Mojave desert tortoise habitat on the project site	Mitigates for the loss of tortoise habitat on the project site by purchasing and protecting suitable off site habitat lands estimated at 24,417 acres
BIO 18	Requires design and implementation of a Raven Monitoring, Management, and Control Plan that is consistent with the most current USFWS-approved raven management guidelines and payment of fees to support the USFWS Regional Raven Management Program	Protects tortoise in the project vicinity by managing the population of ravens, a tortoise predator
BIO 19	Requires pre-construction nest surveys each year during the construction phase if construction activities will occur during the breeding period (from January 1 through August 1); specifies minimum	Mitigates potential impacts to migratory birds by protecting their nests from construction activities.

	requirements for such surveys and establishment of 500-foot buffer areas where active nests are found.	
BIO 20	Requires pre-construction surveys for golden eagle territories within one mile of the project site. If an occupied nest is found within one mile of the project site, a Golden Eagle Monitoring and Management Plan must be prepared according to current USFWS protocols.	Mitigates potential impacts to golden eagles to insignificant levels
BIO 21	Requires pre-construction surveys, avoidance measures, relocation, and acquisition of compensatory habitat mitigation lands for burrowing owls.	Mitigates potential impacts to burrowing owls to insignificant levels
BIO 22	Requires preparation and implementation of an Avian Protection Plan to monitor bird collisions with facility features and use of the monitoring data to inform and develop an adaptive management program to avoid and minimize project-related avian impacts.	Mitigates potential impacts to birds from collision with project equipment to insignificant levels
BIO 23	Requires daily monitoring for the presence of nelson's bighorn sheep and halting of construction activities when the bighorn sheep are within 500 feet.	Mitigates potential impacts to sheep to insignificant levels
BIO 24	Requires pre-construction surveys, avoidance measures, and relocation, for American badgers and desert kit fox.	Mitigates potential impacts to American badger and desert kit fox to insignificant levels
BIO 25	Requires surveys prior to ground disturbance, avoidance, and provision of substitute roosting habitat for bats.	Mitigates potential impacts to bats to insignificant levels
BIO 26	Requires minimization measures for impacts to jurisdictional waters of the state, including acquisition	Mitigates potential impacts to jurisdictional waters to insignificant levels

	of 153 acres of off-site mitigation lands, which may be combined ("nested") with desert tortoise habitat obtained under Condition BIO 17, above, and best management practices in the construction and operation of the project	
BIO 27	Requires installation of netting over project evaporation ponds and implement an Evaporation Pond Design, Monitoring, and Management Plan to protect wildlife from mortality in the ponds	Mitigates potential wildlife mortality at the evaporation ponds to insignificant levels
BIO 28	Requires, at project closure, implementation of a Decommissioning and Reclamation Plan to remove the engineered diversion channels, detention basins, and other sediment control features from the project site	Mitigates potential biological impacts due to closure of the project to insignificant levels
BIO 29	Requires that the facility's closure plan include measures and funding for the decommissioning, reclamation, and revegetation of the project site	Mitigates potential biological impacts due to closure of the project to insignificant levels
BIO 30	Allows the project owner to satisfy certain compensatory mitigation obligations by paying an in lieu fee to the Department of Fish and Game pursuant to Fish and Game code sections 2069 and 2099. Provided that the in lieu fee is found to comply with CEQA and CESA requirements.	Provides the same degree of mitigation as the original requirement.
BIO 31	Allows for the phasing of compensatory mitigation and provision of security deposits according to specified formulas	Does not affect the level of mitigation or protection of the environment.

Dust

Disturbance of the soil's surface caused by construction traffic, operations traffic, and other activities such as mirror washing would result in increased wind erosion of the soil. Windborne transport of dust and sand can result in the degradation of soil and vegetation over a widening area. Dust can have deleterious physiological effects on plants and may affect their productivity and nutritional qualities. Dust and sand can kill plants by burial and abrasion, interrupting natural processes of nutrient accumulation, and allowing the loss of soil resources. The destruction of plants and soil crusts by windblown sand and dust exacerbates the erodibility of the soil and accelerates the loss of nutrients.

To address these potential impacts, we impose Condition **BIO 8** (Impact Avoidance and Minimization Measures) and Air Quality Conditions of Certification **AQ-SC3** and **AQ-SC 7** and **SOIL&WATER-1**. Implementation of these measures would reduce impacts of dust from the proposed project to biological resources to less than significant levels by minimizing and controlling project-related dust sources during construction and operation.

Impacts to Special-Status Plants

Lane Mountain milk-vetch is the only listed threatened or endangered plant species occurring in the region. It is unlikely to occur on or adjacent to the project site because of the site's distance from known occurrences, no plants were found during the field survey, and unsuitable bajada habitat throughout most of the project site. Impacts to this species are less than significant.

One CNPS List 1B species (white-margined beardtongue) was documented on the project site, and five others could occur there, though their probabilities of occurrence are moderate to low. In Condition of Certification **BIO 12** below, we require follow-up field surveys to inventory potential project impacts to white-margined beardtongue and other List 1B species, and impact avoidance measures to conserve occurrences on-site to the greatest extent feasible. This measure provides for the conservation of rare plants in portions of the project site through avoidance and evaluates the potential existence of these species on potential mitigation lands.

Five other plant species that are designated BLM sensitive and CNPS List 1B species have low potential to occur within the project area:

- Desert cymopterus (Cymopterus deserticola)
- Barstow woolly-sunflower (Eriophyllum mohavense)
- Mojave monkeyflower (Mimulus mohavensis) – Low potential
- Creamy blazing-star (Mentzelia tridentate) – Low potential
- Rusby's desert mallow (Sphaeralcea rusbyi var. eremicola) – Low potential

Project impacts to white-margined beardtongue would consist of isolation of some plants and their habitat within the surrounding solar facility during project development and operation. In addition, indirect project impacts to this species could result on-site or off-site, from facility operations (e.g., dust, herbicide overspray, isolation from pollinators or other ecological associations, or alterations to the existing wind and hydrological conditions that transport sand. Proposed project alterations to surface hydrology would avoid or minimize impacts to minor channels where most of the white-margined beardtongue plants on-site are located.

Two white-margined beardtongue locations on the project site are near project area boundaries. One of these, where 17 individual plants were counted, is outside the proposed disturbance area, due to the plants and other resource concerns. Another location, where two plants were mapped, is on the eastern project site boundary, adjacent to the Pisgah Crater ACEC. The proposed project would avoid impacts to these plants and provide a 250 foot buffer area around them. Surface hydrology at both locations would not be altered by proposed project stormwater control structures. The other white-margined beardtongue locations also would be surrounded by 250 foot buffer areas, but would be subject to altered hydrology due to stormwater control as proposed by the applicant.

White-margined beardtongue apparently exists as a local "metapopulation" consisting of scattered small clusters or individual plants at locations that may not persist long-term. Instead, changing environmental conditions such as rainfall, drought, sand movement, or hydrology cause periodic localized extinctions and colonizations. Project development and operation would substantially alter soil, vegetation, and hydrology throughout the project area and would likely prevent new white-margined beardtongue colonizations within the project area.

The above potential impacts to white-margined beardtongue and other CNPS List 1B species are mitigated to insignificant levels by our adoption of Condition of Certification **BIO 12**, which includes measures to provide buffer areas around

white-margined beardtongue locations; monitor and manage direct and indirect project impacts and plant persistence within these areas; and monitor and manage indirect project impacts to occurrences off-site to the east, in the BLM Pisgah Crater ACEC.

Three CNPS List 2 taxa are reported on the project site, though only one of these was confirmed by 2010 field surveys. The other two species remain unconfirmed, and may have been misidentified in the original survey reports. An additional six could occur on the site, with low potential. Most or all occurrences of CNPS List 2 species onsite, whether documented by prior surveys or not, would be lost or substantially degraded due to grading; soil compaction during construction and facilities operation; and the indirect effects of increased weed abundance, weed control, and alterations to hydrology, soil temperatures, and windborne sand transport.

Small-flowered androstephium was reported at 52 locations on the project site and 14 additional occurrences within a 1000 foot buffer surrounding the site (SES 2009aa). Follow-up surveys in 2010 documented more than 1500 additional plants, mapped as one extensive occurrence throughout much of the southern part of the site. While most small-flowered androstephium on-site, would be lost or adversely impacted as described above (except those plants within white-margined beardtongue set-aside areas), those impacts would be less than significant due to numerous additional occurrences documented elsewhere in California in recent years, including new occurrences documented by the applicant on public lands to the west and east, including many in the Pisgah ACEC.

Emory's crucifixion thorn is reported from four individual plants at three locations within the survey area (TS 2010h). All three locations are north of the proposed project area, near the toe slopes of the Cady Mountains. The reduced project footprint avoids direct or indirect effects to those occurrences. Emory's crucifixion thorn is a large and distinctive shrub; it is unlikely that additional plants will be found on-site during future surveys.

Coves' cassia and small-flowered sand-verbena were reported on the project site in the Biological Resources Technical Report in 2009, but were not confirmed during more thorough 2010 field surveys. Staff believes that the original reports may have been erroneous and no impacts to either species are anticipated. However, if either species is found on-site during follow-up field surveys required

by Condition of Certification BIO 12, appropriate avoidance or off-site mitigation measures would be required.

Six other CNPS List 2 species have low or moderate potential to occur within the project area:

- King's eyelash grass (Blepharidachne kingie) – Low potential.
- Booth's evening primrose (Camissonia boothii var. boothii) – Moderate potential.
- Viviparous foxtail cactus (Coryphantha vivipara var. rosea) – Low potential.
- Purple-nerved cymopterus (Cymopterus multinervatus) – Low potential.
- Thorny milkwort (Polygala acanthoclada) – Low potential.
- Jackass clover (Wislizenia refracta ssp. refracta) – Moderate potential.

If any of the six species are found on-site during follow-up field surveys required by Condition of Certification BIO 12, appropriate avoidance or off-site mitigation measures would be implemented.

Wildlife

Construction of the Calico Solar Project would result in large scale direct and indirect impacts to common wildlife. These effects could include mortality from trampling or crushing; increased predation when wildlife is flushed from cover; increased noise levels due to heavy equipment and SunCatcher engine noise; light impacts from construction during low-light periods; increased vehicular and human presence along access roads and desert washes; displacement due to habitat modifications, including vegetation removal, alterations of existing soil conditions; fugitive dust; and a modified hydrologic and sediment regime due to the construction of the storm water management system.

More mobile species like birds and larger mammals are expected to disperse into nearby habitat areas during construction. However, the dispersal of wildlife from active construction zones would be hindered by the projects perimeter fencing (i.e., the tortoise exclusion fence).

By design, the Calico Solar Project would include perimeter fencing to prevent desert tortoise and bighorn sheep from entering the work area. Prior to construction, tortoises inhabiting the project site would be translocated to suitable

receptor sites. With the exception of birds this barrier would exclude or entrap wildlife at the project site. Therefore, during construction, terrestrial wildlife trapped within the perimeter fence would not be able to disperse from the project area. This would subject any trapped wildlife to repeated disturbance from construction and the use of roads to support maintenance activities. (Ex. 300, pp. C.2-63 – C.2-64.)

Construction noise may affect birds in several ways, including annoyance which causes birds to abandon nests that are otherwise suitable; raise the level of stress hormones, interfering with sleep and other activities; cause permanent injury to the auditory system; and interfere with acoustic communication by masking important sounds or sound components. In general, 60 dBA Leq hourly is considered the threshold for disturbance for many bird species, but some species are less sensitive.

Construction could affect wildlife in adjacent habitats by interfering with breeding or foraging activities and movement patterns, causing animals to temporarily avoid areas adjacent to the construction zone. This could disrupt foraging, breeding, sheltering, and other activities. More mobile species like birds and larger mammals are expected to disperse into adjacent habitat areas during the land clearing and grading phases associated with tower construction and road construction and widening. For example, noise and human presence are likely to adversely affect bighorn sheep which are expected to avoid the lower foothills during construction of the proposed project.

Noise from construction activities could also temporarily discourage wildlife from foraging and nesting immediately adjacent to the project area. A maximum noise level of 75 dBA Ldn is estimated to occur at a distance of 50 feet from the acoustic center of the construction activity (most often the power block) and attenuate to 40 dBA Ldn or less at project site boundaries. Assuming that construction noise for this project would be relatively constant, the 40 dBA Ldn estimated at the site boundaries for construction noise would be similar to levels of ambient noise. The loudest noise likely to occur during construction is created by the operation of construction equipment. Depending on the type of equipment used, the noise produced can vary from 77 dBA to 90 dBA at 50 feet.

Noise impacts to nesting birds and other wildlife would be mitigated through implementation of Conditions of Certification **BIO 1** through **BIO 9** and **BIO 19**. These measures require buffer zones around active nests, which will sufficiently attenuate construction noise levels at the nests. (Ex. 300, pp. C.2-64 – C.2-65.)

Special Status Wildlife

Mojave fringe-toed lizards were observed by the applicant and staff at several locations on the project site, and staff estimated that a minimum of 164.7 acres of suitable habitat is found on the site. Direct project impacts to Mojave fringe-toed lizards would include direct loss of habitat during site preparation and construction for the SunCatchers, roads, and drainage channels; mechanical crushing during site preparation, grading of access roads, preparation of staging areas, disturbance by noise or vibrations from the heavy equipment and future operations and maintenance activities; fugitive dust; and general disturbance due to increased human activity. The cryptic nature of Mojave fringe-toed lizards increases the likelihood that individuals could be injured or killed during ground-disturbing activities, even if equipment operators have been trained to avoid them.

Rather than attempt to preserve the pockets of habitat on the project site, staff recommends, and we adopt, Condition of Certification **BIO-13** requiring the acquisition, protection and maintenance of 207.5 acres of suitable off-site habitat for the species. If appropriate, that habitat may be combined or "nested" with desert tortoise habitat obtained for the project. Implementation of that condition will reduce impacts to Gila monsters and their habitat to less-than-significant levels. (Ex. 300, pp. C.2-67 – C.2-70.)

Gila monsters were not observed during biological surveys conducted in 2007, 2008, or 2010. While there is a low potential for occurrence of this species in the project area, this species occurs in low densities, is difficult to detect, and may be overlooked during surveys. If present, direct impacts to this species could include mortality during ground-disturbing activities; being hit by vehicles on access roads; mechanical crushing during site preparation, grading of spur roads or drainage features; fugitive dust; and general disturbance due to increased human activity. Indirect impacts to this species include compaction of soils and the introduction of exotic plant species.

Potential operational impacts include risk of mortality by vehicle strikes and disturbance on access roads due to increased use by the public and maintenance personnel. Other operational impacts include removal and trimming of vegetation during maintenance activities.

Staff's proposed, and we adopt, Condition of Certification **BIO 14** to requires a Gila monster survey concurrent with the desert tortoise clearance surveys and

relocation of any individuals found to suitable habitat outside the project site. Implementation of that condition will reduce impacts to Gila monsters and their habitat to less-than-significant levels. (Ex. 300, p. C.2-70.)

Desert tortoises are present on the CSP project site and the adjacent desert areas both east and west of the site. Protocol surveys conducted in 2010 detected 104 tortoises within the originally proposed project footprint. The highest concentration of tortoises is located north of the Phase 1 boundary of the original project footprint, located on the foothills and bajadas of the Cady Mountains. Burrow density was also concentrated in this area; however, burrows were present to some degree in most of the project area. Although habitat utilized by desert tortoises is present across most of the site, only eight tortoises were observed in the Phase I area. Tortoise densities in the portion of the Phase II area now removed are well over the average tortoise density (4.7 tortoise/km^2) identified by the West Mojave Plan. Because of concerns presented by staff and the wildlife agencies regarding the preservation of habitat near the toe of the Cady Mountains to provide a linkage and movement corridor for desert tortoise, the applicant modified the project footprint to provide approximately 4,000 feet between the project boundary and the base of the mountains as a movement corridor, as recommended by the USFWS Desert Tortoise Recovery Office (DTRO). Subsequent to this modification, the Applicant reduced the project further in response to the September 3, 2010 Committee Order. Scenario 5.5 substantially reduces the number of desert tortoise that will be impacted and require translocation when compared to the previous proposed project configurations. The reduced acreage would avoid some tortoises and would preserve movement areas and occupied habitat for tortoises. Nonetheless, the proposed reduced acreage project would result in the loss of high density tortoise habitat. The 2010 surveys identified 10 tortoises in the reduced project footprint which equates to an estimated 22 tortoises using the USFWS formula. Implementation of Scenario 5.5 would require the translocation of approximately 13 desert tortoise (11 adults and subadults, and 2 juveniles) from the project site compared to approximately 107 (93 adults and subadults and 14 juveniles) for the proposed project. (Ex. 317, p. C.2-14)

Desert Tortoise Impact Summary

		Estimated Number of Adult/Subadult and Juvenile Tortoise				
Project Component	**Habitat (Acres)**	**USFWS Formula (Min-Max)**	**Requiring Trans-location**	**Handled**	**Direct - Indirect Impacts (Min-Max)**	**Maximum Potential Mortality**
Revised Proposed Project	6,215	189 (69-378)	107	321	682 (300-1249)	194 tortoise 436 eggs
Scenario 5.5	4,614	22 (6-59)	13	39	181 (107-292)	29 tortoise 56 eggs

Source: EX. 317, p. C.2-37.

Construction of the proposed project would result in the direct loss of approximately 4,614 acres of occupied desert tortoise habitat, 2,474.1 acres north of the BNSF railroad and 2,139.9 south of the BNSF railroad. Habitat north of the railroad and within the Scenario 5.5 footprint constitutes good quality habitat and supports moderate densities of desert tortoise in some areas. This area is characterized by creosote bush scrub and has less obstructed connectivity to adjacent natural lands. Although habitat for desert tortoise is present in the area between the BNSF railroad and I 40, it provides lower quality habitat for tortoises. This area is isolated by the highway and railroad, has been subject to disturbance from pipeline development, and provides little long-term value to the species. Nonetheless, tortoise sign was detected in this area. In addition, while the railroad poses a substantial barrier to movement, there are numerous corridors for dispersal beneath the many railroad trestles that span drainages.

During construction of the Calico Solar project desert tortoises could be harmed during clearing, grading, and trenching activities or may become entrapped within open trenches and pipes. Construction activities could also result in direct mortality, injury, or harassment of individuals as a result of encounters with vehicles or heavy equipment. Other direct effects could include individual tortoises being crushed or entombed in their burrows, collection or vandalism, disruption of tortoise behavior during construction or operation of facilities, disturbance by noise or vibrations from the heavy equipment and the SunCatcher engines, and injury or mortality from encounters with workers' or visitors' pets. Desert tortoises may also be attracted to the construction area by the application of water to control dust, placing them at higher risk of injury or mortality. Increased human activity and vehicle travel would occur from the construction and improvement of access roads, which could disturb, injure, or kill individual tortoises. Also, tortoises may take shelter under parked vehicles and be killed, injured, or harassed when the vehicle is moved. The applicant has recommended

impact avoidance and minimization measures to reduce these direct impacts to desert tortoise, including installation of exclusion fencing to keep desert tortoises out of construction areas, translocating the resident desert tortoises from the Calico Solar site, reducing construction traffic and speed limits to reduce the incidence of vehicles strikes and worker training programs. These recommendations are included in our conditions of certification, including Conditions **BIO 1** through **BIO 9**, which apply to protect desert tortoise and other biological resources in and near the project area, and Conditions of Certification **BIO 15** through **BIO 17**, which are specific to desert tortoise.

Condition of Certification **BIO 15** (Desert Tortoise Clearance Surveys and Exclusion Fencing) requires installation of security and desert tortoise exclusionary fencing around the entire project site and along access roads. Condition **BIO 16** (Desert Tortoise Translocation Plan) requires that the applicant prepare and implement a desert tortoise translocation plan to move the tortoises found in the project area to proposed translocation sites. Condition **BIO 17** requires the acquisition, improvement, and long term maintenance of compensatory tortoise habitat.

Tortoise translocation, was the subject of extensive testimony and discussion during our evidentiary hearings. The applicant presented a draft Desert Tortoise Translocation Plan showing receptor sites to the west of the project, north of I-40 and to the southwest, in the Ord-Rodman DWMA. To date the Draft Desert Tortoise Translocation Plan remains to be finalized and is being actively reviewed and commented on by the agencies. In addition, testimony provided by the CDFG and other recognized experts during the August 18, 2010 evidentiary hearings is being reviewed by the applicant, staff, and the agencies. Based on the existing recommendations of the agencies and staff, it is expected that revisions will be made to the Translocation Plan prior to approval. The reduction in project size for Scenario 5.5 significantly reduces the number of desert tortoise that would require translocation. This substantially reduces the risks associated with handling and translocating desert tortoise and is expected to limit the amount of translocation mortality that could occur. (EX. 317, p. C.2-33)

During our hearings, the draft Translocation Plan was criticized as inadequate on various grounds. Among the criticism was that from CURE witness Scott Cashen, who complained that the draft Plan failed to meet the recently released guidelines from the USFWS Desert Tortoise Recovery Office entitled Translocation of Desert Tortoises (Mojave Population) From Project Sites: Plan Development Guidance (USFWS Guidance). We will not address the individual

points of departure Mr. Cashen identified as the plan is a draft and is under review, presumably for, among other things, conformance with the USFWS Guidance. We note, however, that the USFWS Guidance specifies the following steps:

- Determining whether the proposed land use is compatible with desert tortoises continuing to live on the site.
- Estimating the number of tortoise that will be affected on the project site through the use of surveys.
- Identifying potential recipient and control sites for the tortoises to be relocated to and on which to monitor tortoises as a control group for comparison with the moved tortoises and their new neighbors.
- Estimating tortoise densities at recipient and control sites.
- Developing the translocation plan in coordination with USFWS, State wildlife agencies, and land management agencies.
- Confirming tortoise densities at the recipient and control sites, health checkups, including blood tests for disease, and attaching transmitters to tortoises. Including the relocated tortoises, density at a receiving site may not exceed 130% of mean density for the desert tortoise recovery unit.
- Determine disposition of tortoises on project site—monitor on site via telemetry, move to quarantine facility off-site, or, if health problems are suspected, transferred to the Desert Tortoise Conservation Center in Las Vegas or other facility for further evaluation, treatment, and potential return to the wild.
- Construct project fencing.
- Prepare, obtain approval, and execute disposition plan.
- Post-translocation monitoring for a minimum of five years.
- Collection of data throughout the process for use by wildlife and permitting agencies.

The Guidance also specifies measures to protect the relocated, receiving area and control area tortoises, such as disinfection of containers used to transport them, hydration within 12 hours of release, release at an unoccupied shelter site and reference to requirements contained in other protocols. In all, we find it to be a comprehensive and thorough program to minimize harm to tortoises.

Condition **BIO-16** requires compliance with the USFWS Guidance as well as any additional guidance from USFWS and CDFG. Further, the plan must be approved by the USFWS, CDFG, BLM's wildlife biologist and our Compliance Project Manager. Having established clear standards for the plan's content in Condition **BIO-16**, we do not need to wait to review the final plan prior to taking action on the project as Mr. Cashen and others suggest.

While there was some disagreement on the numbers, there is general consensus that a substantial percentage of tortoise may perish as a result of the translocation process. It is expected that 85 percent of the juvenile tortoise, by their nature difficult to detect, will not be detected during the Clearance Surveys and will remain on the site during construction, subject to the threats described above. Translocation requirements from the USFWS and CDFG include blood testing of both translocated tortoises and current residents of the receiving area to avoid mixing diseased and healthy tortoises. While multiple efforts will be expended to minimize tortoise mortality, translocated tortoise may still suffer injury or die from the stress of handling, blood testing, predation and other causes. USFWS guidelines require that, for every tortoise translocated, one tortoise in the receiving area and one tortoise in a control area be tested and radio-tagged for tracking. Those tortoises may suffer injury of die from the stress of handling or blood testing and those in the receiving area from the additional competition for food and shelter. A scenario postulated by Staff estimates that the number of tortoise perishing due to the translocation effort may could be as high as the number of tortoise that are relocated. (Ex. 317, pp. C.2-28 – C.2-29, C.2-37 – C.2-38)

The concerns about tortoise mortality are based in large part on the preliminary results of a tortoise translocation program on the Fort Irwin military base to the north east of Barstow, where nearly 50 percent of translocated tortoises have perished in two years following their translocation. (8/25/10 RT, pp. 90 – 92.) Whether the same results will hold for this project is somewhat speculative. BLM biologist Chris Otahal opined that tortoise density in the receiving area influenced mortality and noted that the candidate receptor sites for this project had lower tortoise densities than those in the Fort Irwin project. (8/25/10 RT, pp. 134 – 135.)

<u>Habitat mitigation</u>. The reduction in acreage for Scenario 5.5 would significantly avoid areas currently supporting high concentrations of desert tortoise and their burrows and would substantially increase the width of the linkage area that occurs along the foothills of the Cady Mountains. Mitigation for the loss of 4,614 acres of desert tortoise habitat on the project site is not dependent on the successful relocation of tortoise found on the site. Rather, Staff, the applicant, representatives and the USFWS and CDFG, testified that the acquisition of and enhancement of habitat compensation lands, required by Condition **BIO-17**, serves as the mitigation for the habitat loss. Translocation of tortoises serves to *minimize* harm, a requirement under the California Endangered Species Act, discussed below.

5. Cumulative Impacts

A project may result in a significant cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit. 14, § 15130). Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects is “cumulatively considerable” [14 Cal. Code Regs., § 15130(a).] Such incremental effects are to be “viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects” [14 Cal. Code Regs., § 15164(b)(1).]

The projects considered in the cumulative impacts analysis are described in Staff’s Supplemental Staff Assessment, Biological Resources Table 9 (Ex. 300, pp. C.2-131 – C.2-133).

Waters of the State. The cumulative impacts of Scenario 5.5 on waters of the state would be reduced from those of the original proposal, which staff testified would not be significant after application of the mitigation measures required by Condition **BIO-26.**

Desert Tortoise. Scenarios 5.5’s contribution to cumulative impacts to desert tortoise would not be considerable because the applicant is required to relocate all tortoises from the project area; prevent future on-site impacts to tortoises by fencing the site; monitor and manage raven predation on-site and contribute to regional raven management; and compensate for habitat loss by protecting extensive acreage now presently under conservation management.

Golden Eagle. While the overall loss of foraging habitat for golden eagles within the region is a cumulatively significant impact, the contribution of Scenario 5.5 to that cumulative effect is less than significant after mitigation. Condition of Certification **BIO 20** requires focused nest surveys within 1 mile of project activities and if nests are identified, the project owner would establish a disturbance-free buffer around the nest. No construction activities would be authorized within the 0.5 mile buffer pending the successful fledging of the nest. Implementation of Condition of Certification **BIO 17**, the compensatory mitigation plan for desert tortoise, would offset foraging habitat loss by the preservation of similar plant communities.

Burrowing Owl. Staff testified that Senario 5.5's contribution to significant cumulative effects on the burrowing owl will be less than significant when the incremental effects of the project, after mitigation, are viewed in connection with the effects of other projects. The incremental contribution to the cumulative effects will not be cumulatively considerable because of required avoidance and passive relocation in Condition of Certification **BIO 21** and implementation of Condition of Certification **BIO 17**, the compensatory mitigation plan for desert tortoise, which will also benefit burrowing owls. The acquisition is expected to prevent future losses of habitat by permanently protecting more habitat lands than are being used for the project and further benefit the species by providing funding for long-term maintenance and management activities on those lands.

Le Conte's Thrasher. Scenario 5.5's incremental contribution to the cumulative effects will not be cumulatively considerable because of mitigation measures requiring pre-construction breeding bird surveys and avoidance of active nests (Condition **BIO 19**) and compensatory habitat mitigation for desert tortoise (**BIO-17**).

Migratory Birds. Scenario 5.5's incremental contribution to the cumulative effects on migratory birds will not be cumulatively considerable due to mitigation measures requiring pre-construction breeding bird surveys and avoidance of active nests (Condition **BIO-19**)) compensatory habitat mitigation for desert tortoise (**BIO-17**), and avoidance, minimization, and compensation for impacts to desert washes (**BIO-26**), thereby reducing impacts to migratory birds from habitat loss by the preservation of similar plant communities. Condition of Certification **BIO-22**'s avian protection measures further reduce impacts to migratory birds from solar technology.

Mojave Fringe-Toed Lizard. A potentially significant cumulative impact to Mojave fringe-toed lizards due to blockage of lizard movements from the east to west of the project is mitigated by the project setbacks from the BNSF railroad (Condition **TRANS-7**). The setback area will provide a suitable movement corridor.

Nelson's Bighorn Sheep. Scenario 5.5 would not contribute significantly to the loss of bighorn sheep habitat, as most occupied habitat for Nelson's bighorn sheep within the Cady Mountains does not overlap the northern portion of the scenario's development area. The scenario would avoid large open areas located on the bajada below the Cady Mountains that could provide connectivity to adjacent mountain ranges. Therefore, impacts of either scenario on bighorn sheep are not cumulatively considerable.

American Badger and Desert Kit Fox. Scenario 5.5's incremental contribution to the significant cumulative effects will be less than significant. Avoidance and minimization measures in Condition of Certification **BIO-24** combined with Condition **BIO-17**'s habitat compensation mitigation plan for desert tortoise, will reduce the impacts of habitat loss by the preservation of habitat for other species, including the badger and kit fox.

Bats. Scenario 5.5's incremental contribution to the cumulative effects will be less than significant due to avoidance and minimization measures required by Condition of Certification **BIO 25**, **BIO 17**'s compensatory habitat mitigation for desert tortoise, which preserves habitat similar to that which is being lost, and Condition **BIO-22**'s avian protection measures would further reduce impacts to migratory birds from solar technology.

Wildlife Movement and Connectivity. Scenario 5.5, representing a further separation from the base of the Cady Mountains to the north of the project, further diminishes the project's effect on a key wildlife corridor. It's contribution is not cumulatively considerable.

Plant Communities. Scenario 5.5 would contribute at least incrementally to the cumulative impacts of future projects to Mojave creosote scrub and saltbush scrub, however that contribution would not be cumulatively considerable because the incremental effects would be reduced by the compensatory mitigation of desert tortoise habitat; implementation of Best Management Practices for minimizing construction impacts; and specifications for restoring temporarily disturbed habitat.

White-margined beardtongue. Scenario 5.5 would avoid direct impacts to white-margined beardtongue and its occupied habitat. Areas within the project boundary that contain the plant will be avoided and protected within Environmentally Sensitive Areas. Further, and measures to avoid or minimize off-site impacts to the BLM Pisgah Crater ACEC, including the management of off-site sand transport, are required in Condition of Certification **BIO 12**.

Other Special-Status Plants. Condition of Certification **BIO-12** similarly reduces, through plant avoidance and other measures reduces the contributions of the CSP to cumulative impacts to other special status plants to less than cumulatively considerable levels.

6. LORS Compliance

The CSP must comply with state and federal laws, ordinances, regulations, and standards (LORS) that address state and federally listed species, as well as other sensitive species and habitats, and must secure the appropriate permits to satisfy these LORS. Our analysis of compliance with Federal, State, and Local LORS is summarized in Biological Resources Table 3, below, followed by additional information on selected LORS.

Biological Resources Table 3
Summary of Compliance with LORS

Applicable Law	Description	Rationale for Compliance
FEDERAL		
Federal Endangered Species Act (Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and provides for protection of threatened and endangered plant and animal species and their critical habitat. "Take" of a federally-listed species is prohibited without an incidental take permit, which may be obtained through Section 7 consultation (between federal agencies) or a Section 10 Habitat Conservation Plan.	The applicant is currently undergoing consultation with the USFWS for project impacts to desert tortoise and a Biological Opinion will be issued for the proposed project. In addition, Conditions of Certification BIO-1 through BIO-9 and BIO-15 through BIO-18 include measures to minimize and compensate for impacts to the federally listed desert tortoise.
Migratory Bird Treaty (Title 16, United States Code, sections 703 through 711)	Makes it unlawful to take or possess any migratory nongame bird (or any part of such migratory nongame bird) as designated in the Migratory Bird Treaty Act unless permitted by regulation (e.g., duck hunting).	Condition of Certification BIO-19 includes preconstruction nest surveys, no-disturbance buffers around active nests, and monitoring of nests to minimize impacts to nesting birds covered under the Migratory Bird Treaty Act.
Clean Water Act (Title 33, United States Code, sections 1251 through 1376, and Code of Federal Regulations, part 30, section 330.5(a)(26))	Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the U.S. Army Corps of Engineers (USACE) for a discharge from dredged or fill materials into waters of the U.S., including wetlands. Section 401 requires a permit from a regional water quality control board (RWQCB) for the discharge of pollutants. By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request State certification that the proposed activity will not violate State and federal water quality standards.	Waters of the U.S. do not occur within the project area.
Bald and Golden Eagle Protection Act (Title 16, United States Code section 668)	Provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the take, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the act.	A recently issued Final Rule (September 2009) provides for a regulatory mechanism under the BGPA to permit take of bald or golden eagles comparable to incidental take permits under the ESA. This rule adds a new section at 50 CFR 22.26 to authorize the issuance of permits to take bald eagles and golden eagles on a limited basis. The BGPA defines the ''take'' of an eagle to include a broad range of actions, including disturbance. ''Disturb'' is defined in regulations at 50 CFR 22.3 as: ''to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.'' The proposed project may result in "take" of the golden eagle from disturbance to nesting pairs as well as loss of foraging habitat, which may result loss of

Applicable Law	Description	Rationale for Compliance
		productivity for this species. Golden eagles are known to nest within a 10-mile radius of the project and at least three pairs occur within 5-miles. Results of golden eagle nesting surveys and foraging habitat assessment are required to determine whether construction of the proposed project would result in take of the species and therefore require a permit. The USFWS Migratory Bird Division is in the process of developing guidance regarding implementation of this final rule, including establishing take thresholds within each Bird Conservation Region that must not be exceeded. If it is ultimately determined that take of golden eagle would occur as a result of the proposed project, an individual (non-programmatic) permit would be required. Permit issuance will be conditioned on various criteria, the most important of which is that the permitted take is compatible with the preservation of the bald eagle and the golden eagle (i.e., consistent with the goal of stable or increasing breeding populations). Staff encourages the applicant to coordinate closely with USFWS as guidance becomes available regarding implementation of the revised BGPA. At this time, staff is unable to determine whether the proposed project would be in compliance with the BGPA. Condition of Certification BIO-20 includes preconstruction nest surveys, no-disturbance buffers around active nests, and monitoring of nests to minimize impacts to nesting golden eagles.
California Desert Conservation Area Plan 1980, as amended (reprinted in 1999)	Administered by the BLM, the CDCA Plan requires that proposed development projects are compatible with policies that provide for the protection, enhancement, and sustainability of fish and wildlife species, wildlife corridors, riparian and wetland habitats, and native vegetation resources.	Conditions of Certification BIO-1 through BIO-30 minimize, avoid, and compensate for impacts to various biological resources covered by the CDCA Plan.
California Desert Protection Act of 1994	An Act of Congress which established 69 wilderness areas, the Mojave National Preserve, expanded Joshua Tree and Death Valley National Monuments and redefined them as National Parks. Lands transferred to the National Park Service were formerly administered by the BLM and included significant portions of grazing allotments, wild horse and burro Herd Management Areas, and Herd Areas.	Conditions of Certification BIO-1 through BIO-30 minimize, avoid, and compensate for impacts to various biological resources covered by the California Desert Protection Act of 1994.

Applicable Law	Description	Rationale for Compliance
West Mojave Plan	As an amendment to the CDCA Plan, the BLM produced the West Mojave Plan (WEMO) (BLM 2006). The WEMO is a federal land use plan amendment that (1) presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel (MGS) and nearly 100 other plants and animals and the natural communities of which they are part, and (2) provides a streamlined program for complying with the requirements of the California and federal Endangered Species Acts (BLM et al. 2005).	Conditions of Certification BIO-1 through BIO-30 minimize, avoid, and compensate for impacts to various biological resources covered by the West Mojave Plan.
STATE		
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Protects California's rare, threatened, and endangered species. "Take" of a State-listed species is prohibited without an Incidental Take Permit.	Conditions of Certification BIO-1 through BIO-9 and BIO-15 through BIO-19 would ensure that the project is not likely to jeopardize the continued existence of desert tortoise or Swainson's hawk or result in the degradation of occupied habitat for any State-listed species.
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals of California that are declared rare, threatened, or endangered.	Analysis of potential project impacts to rare, threatened, or endangered species is provided above, and Conditions of Certification are proposed that would minimize impacts to these species.
Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515)	Designates certain species as fully protected and prohibits the take of such species or their habitat unless for scientific purposes (see also California Code of Regulations, Title 14, section 670.7).	Golden eagle is designated as fully protected and has been observed in the project area. However, Condition of Certification BIO-20 includes preconstruction nest surveys, no-disturbance buffers around active nests, and monitoring of nests to minimize impacts to golden eagles.
Nest or Eggs (Fish and Game Code section 3503 and 3503.5)	Protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.	Condition of Certification BIO-19 includes preconstruction nest surveys, no-disturbance buffers around active nests, and monitoring of nests to minimize impacts to nesting birds. Condition of Certification BIO-6 includes a Worker Environmental Awareness Program to educate workers about compliance with environmental regulations, including Fish and Game Code section 3503.
Migratory Birds (Fish and Game Code section 3513)	Protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds.	Condition of Certification BIO-19 includes preconstruction nest surveys, no-disturbance buffers around active nests, and monitoring of nests to minimize impacts to nesting birds. Condition of Certification BIO-6 includes a Worker Environmental Awareness Program to educate workers about compliance with environmental regulations, including Fish and Game Code section 3513.
Significant Natural Areas (Fish and Game Code section 1930 et seq.)	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.	Refuges, natural sloughs, riparian areas, and vernal pools do not occur on the project site.

Applicable Law	Description	Rationale for Compliance
California Environmental Quality Act (CEQA), CEQA Guidelines section 15380	CEQA defines rare species more broadly than the definitions for species listed under the State and federal Endangered Species Acts. Under section 15830, species not protected through State or federal listing but nonetheless demonstrable as "endangered" or "rare" under CEQA should also receive consideration in environmental analyses. Included in this category are many plants considered rare by the California Native Plant Society (CNPS) and some animals on the CDFG's Special Animals List.	Implementation of Conditions of Certification BIO-1 through BIO-30 would ensure that the project remains in compliance with CEQA.
Streambed Alteration Agreement (Fish and Game Code sections 1600 et seq.)	Regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFG in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process.	Condition of Certification BIO-26 includes measures to minimize and avoid impacts to jurisdictional waters of the State.
California Native Plant Protection Act of 1977 (Fish and Game Code section 1900 et seq.)	Designates State rare, threatened, and endangered plants.	Conditions of Certification BIO-10 through BIO-12 include restoration and compensation for impacts to native plant communities, a Weed Management Plan, special-status plant surveys, and minimization and avoidance measures to minimize impacts to special-status plants.
California Desert Native Plants Act of 1981 (Food and Agricultural Code section 80001 et seq. and California Fish and Game Code sections 1925-1926)	Protects non-listed California desert native plants from unlawful harvesting on both public and private lands in Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego Counties. Unless issued a valid permit, wood receipt, tag, and seal by the commissioner or sheriff, harvesting, transporting, selling, or possessing specific desert plants is prohibited.	Condition of Certification BIO-12 includes a Protected Plant Salvage Plan, which would minimize impacts to specific native desert plants.
LOCAL		
San Bernardino County General Plan: Conservation/Open Space Element of the County General Plan (County of San Bernardino 2007)	Includes objectives to preserve water quality and open space to benefit biological resources, and specific policies and goals for protecting areas of sensitive plant, soils and wildlife habitat and for assuring compatibility between natural areas and development. Although the Calico Solar Project is not located on lands under county jurisdiction, the general plan provides objectives which are consistent with some of the LORS listed above.	Implementation of Conditions of Certification BIO-1 through BIO-30 would ensure that the project remains in compliance with the San Bernardino County General Plan.

a. State

The Energy Commission has a one-stop permitting process for all thermal power plants rated 50 MW or more under the Warren-Alquist Act (Pub. Res. Code § 25500). Under the act, the Energy Commission's certificate is "in lieu of" other state, local, and regional permits (*Ibid*.) The Commission's streamlined permitting process accomplishes a primary objective of the Renewable Energy Action Team, as identified in the Governor's Executive Order S-14-08 — to create a "one stop" process for permitting renewable energy generation facilities under California law. The adopted Conditions of Certification would satisfy the following state LORS and take the place of terms and conditions that, but for the Commission's exclusive authority, would have been included in the following state permits:

Incidental Take Permit: California Endangered Species Act (Fish and Game Code §§ 2050 et seq.) The California Endangered Species Act (CESA) prohibits the "take" (defined as "to hunt, pursue, catch, capture, or kill") of state-listed species except as otherwise provided in state law. Construction and operation of the CSP project will result in the take of desert tortoise, listed as threatened under CESA. Condition **BIO-17** specifies compensatory mitigation for desert tortoise habitat loss at 5:1, 3:1, and 1:1 ratios, based on habitat quality, with BLM "nesting" their 1:1 mitigation requirement within this framework. This funding and mitigation approach provides full mitigation for desert tortoise.

Streambed Alteration Agreement, California Fish and Game Code §§ 1600 1607. Pursuant to these sections, CDFG typically regulates all changes to the natural flow, bed, or bank, of any river, stream, or lake that supports fish or wildlife resources. Construction and operation of the CSP would result in direct or indirect impacts to up to 175 acres of waters of the state. Staff recommends Condition of Certification **BIO-19**, which we adopt, to assure compliance.

b. Federal

The CSP project is located on federal land under BLM's jurisdiction and is therefore subject to the provisions of BLM's California Desert Conservation Area (CDCA) Plan (Revised 1999). As an amendment to the CDCA Plan, BLM produced the Northern and Eastern Mojave (NEMO) Coordinated Management Plan (BLM 2002). This document consists of proposed management actions and alternatives for public lands in the NEMO Planning Area. The CSP project is located in the southeastern portion of the NEMO Planning Area Boundary.

The BLM has worked with the USFWS to develop a variety of land designations as tools to protect sensitive biological resources, including the desert tortoise. The siting of the CSP project considered the management direction of these designations, as described below:

- Desert Wildlife Management Areas (DWMA) are general areas recommended by the Desert Tortoise Recovery Plan (USFWS 1994) within which recovery efforts for the desert tortoise would be concentrated. DWMAs had no specific legal boundaries in the 1994 Recovery Plan. The BLM formalized the general DWMAs from the 1994 Recovery Plan through its planning process and administers them as Areas of Critical Environmental Concern (see below). The CSP project does not fall within any DWMA.

- Area of Critical Environmental Concern (ACEC) are specific, legally defined, BLM designations where special management is needed to protect and prevent irreparable damage to important historical, cultural, scenic values, fish and wildlife, and natural resources or to protect life and safety from natural hazards. The CSP project is not included within any designated ACEC.

- Critical Habitat consists of specific areas defined by the USFWS as areas essential for the conservation of the listed species, which support physical and biological features essential for survival and that may require special management considerations or protection. Critical habitat for the desert tortoise was designated in 1994, largely based on proposed DWMAs in the draft Recovery Plan. The CSP project is approximately 5 miles from the nearest desert tortoise critical habitat.

BLM provides management direction for species such as desert tortoise within the NEMO, which include five geographical areas of tortoise habitat in the planning area. These areas include an Ivanpah Valley and a North Ivanpah Valley area, with the CSP project located within the Ivanpah Valley habitat area. Current designations for both Ivanpah areas are as Category III desert tortoise habitat. Category III management goals are to limit tortoise habitat and population declines to the extent possible by mitigating impacts.

Potential take of the desert tortoise, listed as threatened by the USFWS, requires compliance with the federal Endangered Species Act (ESA) (16 USC §§ 1531 et seq.). “Take” of a federally-listed species is prohibited without an Incidental Take Permit, which would be obtained through a Section 7 consultation between BLM and the USFWS.

In order to construct and operate the CSP on BLM managed lands, the applicant has applied for a Right of Way Permit from BLM, which will address the project's compliance with federal law.

7. Public Comment

We find no comments which raise a substantial new environmental issue and require a specific response.

FINDINGS OF FACT

Based on the evidence, we find the following:

1. Construction and operation of CSP will disturb approximately 4,614 acres of previously undisturbed desert habitat.
2. The diverse plant communities and landscape features in and around the CSP site support a broad diversity of wildlife, including various threatened, endangered and special-status species.
3. The CSP project area provides forage, cover, roosting, and nesting habitat for a variety of bird species.
4. Implementation of Conditions of Certification **BIO-1** through **BIO-12** and**BIO-17** will reduce impacts to plant species to insignificant levels.
5. Implementation of Conditions of Certification **BIO-1** through **BIO-9** and **BIO-13** through **BIO-27** will reduce impacts to bird and wildlife species to insignificant levels.
6. A mitigation ratio as specified in the **BIO** conditions is appropriate for the provision of habitat compensation lands for desert tortoise and other wildlife species.
7. The effects of dust on wildlife and plants will be mitigated by the implementation of Conditions **AQ-SC3**, **AQ-SC4**, **AQ-SC-7** and **Soil&Water-1**.
8. Construction noise is not expected to have a substantial impact on nearby wildlife with the implementation of Conditions **NOISE-1** through **NOISE-6**.

CONCLUSIONS OF LAW

1. The project owner will implement appropriate avoidance and mitigation measures to prevent significant adverse impacts to all sensitive species.

2. With implementation of the mitigation measures described in the evidentiary record and incorporated into the Conditions of Certification below, as well as

those in other portions of this Decision, the project will not result in significant direct, indirect, or cumulative impacts to biological resources.

3. With implementation of the mitigation measures described in the evidentiary record and incorporated into the Conditions of Certification, the CSP will conform to all applicable laws, ordinances, regulations, and standards related to biological resources as identified above.

CONDITIONS OF CERTIFICATION

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall assign at least one Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM) and the Bureau of Land Management's (BLM's) Wildlife Biologist for approval in consultation with the California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (USFWS).

The Designated Biologist must meet the following minimum qualifications: Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;

1. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;

2. Have at least one year of field experience with biological resources found in or near the project area;

3. Meet the current USFWS Authorized Biologist qualifications criteria (http://www.fws.gov/ventura/speciesinfo/protocols_guidelines), demonstrate familiarity with protocols and guidelines for the desert tortoise, and be approved by the USFWS; and

4. Possess a California ESA Memorandum of Understanding pursuant to Section 2081(a) for desert tortoise.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of BLM's Wildlife Biologist and the CPM, in consultation with CDFG and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

Verification: No fewer than 30 days prior to construction-related ground disturbance, the Designated Biologist(s) shall complete a USFWS Desert Tortoise Authorized Biologist Request Form

(http://www.fws.gov/ventura/speciesinfo/protocols guidelines) and submit it to the USFWS, BLM's Wildlife Biologist, and the CPM for review and final approval.

The project owner shall submit the resume of the Designated Biologist to the CPM and BLM within 7 days of receiving the Energy Commission Decision. No construction-related ground disturbance, grading, boring, or trenching shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to BLM's Wildlife Biologist and the CPM as soon as possible prior to the termination or release of the Designated Biologist. In an emergency, the project owner shall immediately notify the BLM's Wildlife Biologist and the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to BLM's Wildlife Biologist and the CPM and for consideration.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist performs the activities described below during any site mobilization activities, construction-related ground disturbance, grading, boring, or trenching activities. The Designated Biologist may be assisted by the approved Biological Monitor(s) but remains the contact for the project owner, BLM's Wildlife Biologist, and the CPM. The Designated Biologist Duties shall include the following:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;

2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRM IMP) to be submitted by the project owner;

3. Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special-status species or their habitat;

4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction

inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;

6. Notify the project owner, the BLM's Wildlife Biologist and the CPM of any non-compliance with any biological resources condition of certification;

7. Respond directly to inquiries of BLM's Wildlife Biologist and the CPM regarding biological resource issues;

8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Compliance Report to both the CPM and BLM Wildlife Biologist;

9. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and USFWS guidelines on desert tortoise surveys and handling procedures (http://www.fws.gov/ventura/speciesinfo/protocols guidelines); and

10. Maintain the ability to be in regular, direct communication with representatives of CDFG, USFWS, BLM's Wildlife Biologist , and the CPM, including notifying these agencies of dead or injured listed species and reporting special-status species observations to the California Natural Diversity Data Base.

Verification: The Designated Biologist shall provide copies of all written reports and summaries that document biological resources compliance activities in the Monthly Compliance Reports submitted to BLM's Wildlife Biologist and the CPM. If actions may affect biological resources during operation a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless his or her duties cease, as approved by BLM's Wildlife Biologist and the CPM.

BIOLOGICAL MONITOR QUALIFICATIONS

BIO-3 The Designated Biologist shall submit the resume, at least three references, and contact information of each of the proposed Biological Monitors to BLM's Wildlife Biologist and the CPM. The resume shall demonstrate, to the satisfaction of the BLM's Wildlife Biologist and the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks. The Biological Monitor is the equivalent of the USFWS designated Desert Tortoise Monitor (USFWS 2008c).

Biological Monitor(s) training by the Designated Biologist shall include familiarity with the conditions of certification, BRM IMP, WEAP, and USFWS guidelines on desert tortoise surveys and handling procedures (http://www. fws.gov/ventura/speciesinfo/protocols guidelines).

Verification: The project owner shall submit the specified information to the BLM's Wildlife Biologist and the CPM for approval at least 30 days prior to the start of any site mobilization or construction-related ground disturbance, grading, boring, and trenching. The Designated Biologist shall submit a written statement to BLM's Wildlife Biologist and the CPM confirming that individual Biological Monitor(s) has been trained including the date when training was completed. If additional biological monitors are needed during construction, the specified information shall be submitted to BLM's Wildlife Biologist and the CPM for approval at least 10 days prior to their first day of monitoring activities.

BIOLOGICAL MONITOR DUTIES

BIO-4 The Biological Monitors shall assist the Designated Biologist in conducting surveys and in monitoring of site mobilization activities, construction-related ground disturbance, grading, boring, or trenching. The Designated Biologist shall remain the contact for the project owner, BLM's Wildlife Biologist, and the CPM.

Verification: The Designated Biologist shall submit in the Monthly Compliance Report to BLM's Wildlife Biologist and the CPM and copies of all written reports and summaries that document biological resources compliance activities, including those conducted by Biological Monitors. If actions may affect biological resources during operation a Biological Monitor, under the supervision of the Designated Biologist, shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless their duties cease, as approved by BLM's Wildlife Biologist and the CPM.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-5 The project owner's construction/operation manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources conditions of certification. The Designated Biologist shall have the authority to immediately stop any activity that is not in compliance with these conditions and/or order any reasonable measure to avoid take of an individual of a listed species. If required by the Designated Biologist and Biological Monitor(s), the project owner's construction/operation manager shall halt all site mobilization, ground disturbance, grading, boring, trenching, and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;

2. Inform the project owner and the construction/operation manager when to resume activities; and

3. Notify BLM's Wildlife Biologist and the CPM if there is a halt of any activities and advise them of any corrective actions that have been taken or would be instituted as a result of the work stoppage.

4. If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

Verification: The project owner shall ensure that the Designated Biologist or Biological Monitor notifies BLM's Wildlife Biologist and the CPM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify BLM's Wildlife Biologist and the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure would be made by BLM's Wildlife Biologist and the CPM within five working days after receipt of notice that corrective action is completed, or the project owner would be notified by BLM's Wildlife Biologist and the CPM that coordination with other agencies would require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

BIO-6 The project owner shall develop and implement a Project-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from BLM's Wildlife Biologist and the CPM. The WEAP shall be administered to all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The WEAP shall be implemented during site preconstruction, construction, operation, and closure. The WEAP shall:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media, including photographs of protected species, is made available to all participants;

2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas, and explain the reasons for

protecting these resources; provide information to participants that no snakes, reptiles, or other wildlife shall be harmed;

3. Place special emphasis on desert tortoises, Mojave fringe-toed lizards, burrowing owls, golden eagles, nesting birds, badgers, and white-margined beardtongue, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;

4. Include a discussion of fire prevention measures to be implemented by workers during project activities; request workers dispose of cigarettes and cigars appropriately and not leave them on the ground or buried;

5. Require all property owner's contractors and employees to participate in BNSF's environmental sensitivity training program prior to commencing work at the Project site;

6. Describe the temporary and permanent habitat protection measures to be implemented at the project site;

7. Identify whom to contact if there are further comments and questions about the material discussed in the program;

8. Include printed training materials, including photographs and brief descriptions of desert tortoises, Mojave fringe-toed lizards, burrowing owls, golden eagles, nesting birds, badgers, and white-margined beardtongue, including behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;

9. Prominently display posters and descriptions in offices, conference rooms, employee break rooms, and other areas where employees may congregate of desert tortoises, Mojave fringe-toed lizards, burrowing owls, golden eagles, nesting birds, badgers, and white-margined beardtongue, including behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures; and

10. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: Within 7 days of publication of the Energy Commission's License Decision, or the Record of Decision/ROW Issuance, whichever comes first, the project owner shall provide to BLM's Wildlife Biologist and the CPM a copy of the final WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to construction-related ground disturbance activities the project owner shall submit two copies of the BLM- and CPM-approved final WEAP. Training acknowledgement forms signed during construction shall be kept on file by the project owner for at least 6 months after the start of commercial operation.

Throughout the life of the project, the WEAP shall be repeated annually for permanent employees, and shall be routinely administered within one week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area. Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to BLM's Wildlife Biologist and the CPM upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate that they have completed the training.

During project operation, signed statements for operational personnel shall be kept on file for 6 months following the termination of an individual's employment.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-7 The project owner shall develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRM IMP), and shall submit two copies of the proposed BRMIMP to the BLM-Wildlife Biologist and the CPM for review and approval. The project owner shall implement the measures identified in the approved BRMIMP. The BRMIMP shall incorporate avoidance and minimization measures described in final versions of the Hazardous Materials Plan; the Revegetation Plan; the Weed Management Plan; the Special-Status Plant Protection and Monitoring Plan; the Special-Status Plant Remedial Action Plan; the Seed Collection Plan; the Protected Plant Salvage Plan; the Desert Tortoise Translocation Plan; the Raven Monitoring, Management, and Control Plan; the Burrowing Owl Monitoring and Mitigation Plan; the Burrowing Owl Relocation Area Management Plan; the Bighorn Sheep Mitigation Plan; the Streambed Management Plan; and the Evaporation Pond Design, Monitoring, and Management Plan.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall include accurate and up-to-date maps depicting the location of sensitive biological resources that require temporary or permanent protection during construction and operation. The BRMIMP shall include complete and detailed descriptions of the following:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;

2. All biological resources conditions of certification identified as necessary to avoid or mitigate impacts;

3. All biological resource mitigation, monitoring, and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion, the CDFG 2080.1 consultation, and BLM stipulations;

4. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure;

5. All required mitigation measures for each sensitive biological resource;

6. All measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;

7. Duration for each type of monitoring and a description of monitoring methodologies and frequency;

8. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;

9. All performance standards and remedial measures to be implemented if performance standards are not met;

10. Biological resources-related facility closure measures including a description of funding mechanism(s);

11. A process for proposing plan modifications to BLM's Wildlife Biologist and the CPM and appropriate agencies for review and approval; and

12. A requirement to submit any sightings of any special-status species that are observed on or in proximity to the project site, or during project surveys, to the California Natural Diversity Data Base (CNDDB) per CDFG requirements.

Verification: The project owner shall submit the final BRMIMP to BLM's Wildlife Biologist and the CPM at least 30 days prior to start of any

preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching. The BRMIMP shall contain all of the required measures included in all biological Conditions of Certification. No construction-related ground disturbance, grading, boring, or trenching may occur prior to approval of the final BRMIMP by BLM's Wildlife Biologist and the CPM.

If any permits have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to BLM's Wildlife Biologist and the CPM within five days of their receipt, and the BRM IMP shall be revised or supplemented to reflect the permit conditions within at least 10 days of their receipt by the project owner. Ten days prior to site and related facilities mobilization, the revised BRM IMP shall be resubmitted to BLM's Wildlife Biologist and the CPM.

To verify that the extent of construction disturbance does not exceed that described in this analysis, the project owner shall submit aerial photographs, at an approved scale, taken before and after construction to the CPM and BLM's Wildlife Biologist. The first set of aerial photographs shall reflect site conditions prior to any preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching, and shall be submitted at least 30 days prior to initiation of such activities. The second set of aerial photographs shall be taken subsequent to completion of construction, and shall be submitted to the CPM and BLM's Wildlife Biologist no later than 90 days after completion of construction. The project owner shall also provide a final accounting of the acreages of vegetation communities/cover types present before and after construction and a depiction of the approved project boundaries superimposed on the post project aerial photograph. If final acreages and/or disturbance footprints exceed those previously approved, the project owner shall coordinate with staff, CDFG, and USFWS to determine appropriate mitigation for such impacts. Such mitigation may exceed the requirements as outlined in these Conditions of Certification (i.e., higher mitigation ratios may be imposed at the discretion of the wildlife agencies).

Verification: Any changes to the approved BRMIMP (including the project footprint) must be approved by BLM's Wildlife Biologist and the CPM and in consultation with CDFG and USFWS before such action is taken. Implementation of BRMIMP measures (for example, construction activities that were monitored, species observed) shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Wildlife Biologist and the CPM, for review and approval, a written Construction Termination Report identifying which items of the BRMIMP have been completed, summarizing all modifications to mitigation measures made during the project's preconstruction site mobilization and construction-related ground disturbance, grading, boring, and trenching, naming any mitigation and monitoring items still outstanding, and providing a timeline for implementing outstanding items. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize the

Construction Termination Report to fulfill its reporting requirements to be outlined in the BRIMP.

IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-8 The project owner shall undertake the following measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to biological resources. All measures shall be subject to review and approval by the CPM.

1. Limit Disturbance Areas and Perimeter Fencing. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas lacking native vegetation and which do not provide habitat for special-status species. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, project vehicles, and equipment shall be confined to the flagged areas. Tortoise fencing shall be placed along the outside perimeter of the access road that would provide access to areas north of the project site.

2. Minimize Road Impacts. New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

3. Minimize Traffic Impacts. Vehicular traffic during project construction and operation shall be confined to existing designated routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit shall not exceed 25 miles per hour within the project area, on maintenance roads for linear facilities, or on access roads to the project site. Speed limits on paved roads shall be consisted with posted speed limits.

4. Monitor During Construction. Due to the likelihood that juvenile desert tortoises may persist on the site after desert tortoise clearance surveys and exclusion fencing are completed, the Designated Biologist or Biological Monitor shall be present at the construction site during all project activities that have potential to

disturb soil, vegetation, and wildlife. The Designated Biologist or Biological Monitor shall walk immediately ahead of equipment during brushing and grading activities. Any time over the life of the project that a desert tortoise is found within the exclusion fencing, the Designated Biologist shall immediately contact the CPM, CDFG, BLM and USFWS; monitor the tortoise's location and activities; and implement translocation of the animal in accordance with and the approved Desert Tortoise Translocation Plan and in consultation with the USFWS, CDFG, BLM, and CPM.

5. Minimize Impacts of Transmission/Pipeline Alignments, Roads, Staging Areas. Staging areas for construction on the plant site shall be within the area that has been fenced with desert tortoise exclusion fencing and cleared. For construction activities outside of the plant site (transmission line, pipeline alignments) access roads, pulling sites, and storage and parking areas shall be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLI C's) S*uggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Mitigating Bird Collisions with Power Lines* (APLIC 2004) to reduce the likelihood of large bird electrocutions and collisions.

6. Avoid Use of Toxic Substances. Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.

7. Minimize Lighting Impacts. Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards wildlife habitat.

8. Avoid Vehicle Impacts to Desert Tortoise. Parking and storage shall occur within the area enclosed by desert tortoise exclusion fencing to the extent feasible. No vehicles or construction equipment parked outside the fenced area shall be moved prior to an inspection of the ground beneath the vehicle for the presence of desert tortoise. If a desert tortoise is observed, it shall be left to move on its own. If it does not move within 15 minutes, a Designated Biologist or Biological Monitor under the Designated Biologist's direct supervision may remove and relocate the animal to a safe location if temperatures are within the range described in the USFWS' 2009 *Desert Tortoise Field Manual* (http ://www.fws.gov/ventura/speciesi nfo/protocols_ guidelines). All tortoise translocation will be consistent with the measures identified in the Desert Tortoise Translocation Plan._All access roads outside of the fenced project footprint shall be delineated with

temporary desert tortoise exclusion fencing on either side of the access road, unless otherwise authorized by the CPM, BLM Wildlife Biologist, USFWS, and CDFG.

9. Avoid Wildlife Pitfalls:

   a. Avoid Wildlife Entrapment. At the end of each work day, the Designated Biologist shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled. If backfilling is not done, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with desert tortoise-exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with desert tortoise exclusion fencing shall be inspected periodically, but no less than three times, throughout the day and at the end of each workday by the Designated Biologist or a Biological Monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual as described in the Desert Tortoise Relocation/Translocation Plan. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

   b. Avoid Entrapment of Desert Tortoise. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches aboveground area) for one or more nights, shall be inspected for tortoises before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks.

10. Minimize Standing Water. Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract desert tortoises and common ravens to construction sites. A Biological Monitor shall patrol these areas to ensure water does not puddle and shall take appropriate action to reduce water application where necessary.

11. Dispose of Road-killed Animals. Road-killed animals or other carcasses detected on roads near the project area shall be picked up immediately and delivered to the Biological Monitor. For special-status species roadkill, the Biological Monitor shall contact USFWS and CDFG within 1 working day of receipt of the carcass for guidance on disposal or storage of the carcass. The Biological

Monitor shall report the special-status species record as described in Conditions of Certification **BIO-2** and **BIO-26.**

12. Minimize Spills of Hazardous Materials. All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall be informed of any hazardous spills immediately as directed in the project Hazardous Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil properly disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated area. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.

13. Worker Guidelines. During construction all trash and food-related waste shall be placed in self-closing containers and removed from the site regularly to prevent overflow. Workers shall not feed wildlife or bring pets to the project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons. Vehicular traffic shall be confined to existing routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit when traveling on dirt access routes within desert tortoise habitat shall not exceed 25 miles per hour.

14. Implement Erosion Control Measures. Standard erosion control measures shall be implemented for all phases of construction and operation to prevent any sediment run-off from exposed slopes from entering state-jurisdictional streambeds on or off the Project site. Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into the streambed. All disturbed soils and roads within the project site shall be stabilized to reduce erosion potential, both during and following construction, except that soil stabilizer use may be limited in portions of roads crossing washes or stream channels consistent with applicable water quality requirements.

15. Monitor Ground-Disturbing Activities Prior to Pre-Construction Site Mobilization. If pre-construction site mobilization requires ground-disturbing activities such as for geotechnical borings or hazardous waste evaluations, a Designated Biologist or Biological Monitor shall be present to monitor any actions that could disturb soil, vegetation, or wildlife.

16. Control and Regulate Fugitive Dust. To reduce the potential for the transmission of fugitive dust the project owner shall implement dust control measures. These shall include:

    a. The project owner shall apply non-toxic soil binders, equivalent or better in efficiencies than the CARB-approved soil binders, to active unpaved roadways, unpaved staging areas, and unpaved parking area(s) throughout construction to reduce fugitive dust emissions.

    b. Water the disturbed areas of the active construction sites at least three times per day and more often if uncontrolled fugitive dust is noted.

    c. Enclose, cover, water twice daily, and/or apply non-toxic soil binders according to manufacturer's specifications to exposed piles with a 5 percent or greater silt content.

    d. Establish a vegetative ground cover, consistent with **BIO-10,** or otherwise create stabilized surfaces on all unpaved areas at each of the construction sites within 21 days after active construction operations have ceased, consistent with erosion control measures described above.

    e. Increase the frequency of watering, if water is used as a soil binder for disturbed surfaces, or implement other additional fugitive dust mitigation measures, to all active disturbed fugitive dust emission sources when wind speeds (as instantaneous wind gusts) exceed 25 mph.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to BLM's Wildlife Biologist and the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

COMPLIANCE VERIFICATION

BIO-9 The project owner shall provide Energy Commission staff, BLM, CDFG, and USFWS with reasonable access to the project site and mitigation lands under the control of the project owner and shall otherwise fully cooperate with the Energy Commission's and BLM's efforts to verify the project owner's compliance with, or the effectiveness of, mitigation measures set forth in the conditions of certification. The project owner shall hold harmless the Designated Biologist, the Energy Commission and staff, BLM, and any other agencies with regulatory requirements

addressed by the Energy Commission's sole permitting authority for any costs the project owner incurs in complying with the management measures, including stop work orders issued by the CPM or the Designated Biologist. The Designated Biologist shall do all of the following:

1. Notification. Notify the CPM, BLM, CDFG, and USFWS at least 14 calendar days before initiating ground-disturbing activities. Immediately notify the CPM, BLM, CDFG, and USFWS in writing if the project owner is not in compliance with any conditions of certification, including but not limited to any actual or anticipated failure to implement mitigation measures within the time periods specified in the conditions of certification. CDFG shall be notified at their Southern Region Headquarters Office, 4949 Viewridge Avenue, San Diego, CA 92123; (858) 467-4201. USFWS shall be notified at their Ventura office at 2493 Portola Road, Suite B, Ventura, CA 93003; (805) 644-1766.

2. Monitoring During Grading. Remain on site daily while grubbing and grading are taking place to avoid or minimize take of listed species, to check for compliance with all impact avoidance and minimization measures, and to check all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protected zones.

3. Fence Monitoring. During construction maintain and check desert tortoise exclusion fences on a daily basis to ensure the integrity of the fence is maintained. The Designated Biologist shall be present on site to monitor construction and determine fence placement during fence installation. During operation of the project, fence inspections shall occur at least once per month throughout the life of the project, and within 24 hours after storms or other events that might affect the integrity and function of desert tortoise exclusion fences. Fence repairs shall occur within two days (48 hours) of detecting problems that affect the functioning of the desert tortoise exclusion fencing. If fence damage occurs during any time of year when tortoises may be active, the project owner shall be responsible for monitoring the site of the damaged fence until it is fully repaired, to prevent a desert tortoise from entering the project area. All incidents of damaged tortoise exclusion fence, including dates of damage and repair; extent of damage; and monitoring summaries (methods and results) shall be reported to the BLM, CPM, CDFG, and USFWS. All wildlife found entrapped or dead in the fence shall be reported to the BLM, CPM, CDFG, and USFWS.

4. Monthly Compliance Inspections. Conduct compliance inspections at a minimum of once per month after clearing, grubbing, and

grading are completed and submit a monthly compliance report to the CPM, BLM, USFWS, and CDFG. All observations of listed species and their sign shall be reported to the Designated Biologist for inclusion in the monthly compliance report.

5. Annual Listed Species Status Report. No later than January 31 of every year the Project facility remains in operation, provide the CPM, BLM, USFWS, and CDFG an annual Listed Species Status Report, which shall include, at a minimum: 1) a general description of the status of the project site and construction/operation activities, including actual or projected completion dates, if known; 2) a copy of the table in the BRMIMP with notes showing the current implementation status of each mitigation measure; 3) an assessment of the effectiveness of each completed or partially completed mitigation measure in minimizing and compensating for project impacts, 4) recommendations on how effectiveness of mitigation measures might be improved, and 5) a summary of any agency approved modifications to the BRMIMP.

6. Final Listed Species Mitigation Report. No later than 45 days after initiation of project operation, provide the CPM a Final Listed Species Mitigation Report that shall include, at a minimum: 1) a copy of the table in the BRMIMP with notes showing when each of the mitigation measures was implemented; 2) all available information about project-related incidental take of listed species; 3) information about other project impacts on the listed species; 4) construction dates; 5) an assessment of the effectiveness of conditions of certification in minimizing and compensating for project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the listed species; and 7) any other pertinent information, including the level of take of the listed species associated with the project.

7. Notification of Injured, Dead, or Relocated Listed Species. In the event of a sighting in an active construction area (e.g., with equipment, vehicles, or workers), injury, kill, or relocation of any listed species, the CPM, BLM, CDFG, and USFWS shall be notified immediately by phone by the Designated Biologist or Biological Monitor. Notification shall occur no later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine if further actions are required to protect listed species. Written follow-up notification via FAX or electronic communication shall be submitted to these agencies within five calendar days of the incident and include the following information as relevant:

a. Injured Desert Tortoise. If a desert tortoise is injured as a result of project-related activities during construction, the Designated Biologist shall immediately take it to a CDFG-approved wildlife rehabilitation and/or veterinarian clinic. Any veterinarian bills for such injured animals shall be paid by the project owner. Following phone notification as required above, the CPM, BLM, CDFG, and USFWS shall determine the final disposition of the injured animal, if it recovers. Written notification shall include, at a minimum, the date, time, location, circumstances of the incident, and the name of the facility where the animal was taken.

b. Desert Tortoise Fatality. If a desert tortoise is killed by project-related activities during construction or operation, or if a desert tortoise is otherwise found dead, submit a written report with the same information as an injury report. These desert tortoises shall be salvaged according to guidelines described in Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoise (Berry 2001). The project owner shall pay to have the desert tortoises transported and necropsied. The report shall include the date and time of the finding or incident.

8. Stop Work Order. The CPM/BLM may issue the project owner a written stop work order to suspend any activity related to the construction or operation of the project to prevent or remedy a violation of one or more conditions of certification (including but not limited to failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or candidate species. The project owner shall comply with the stop work order immediately upon receipt thereof.

Verification: No later than two calendar days following the above-required notification of a sighting, kill, injury, or relocation of a listed species, the project owner shall deliver to the CPM, BLM, CDFG, and USFWS via FAX or electronic communication the written report from the Designated Biologist describing all reported incidents of the sighting, injury, kill, or relocation of a listed species, identifying who was notified and explaining when the incidents occurred. In the case of a sighting in an active construction area, the project owner shall, at the same time, submit a map (e.g., using Geographic Information Systems) depicting both the limits of construction and sighting location to the CPM, BLM, CDFG, and USFWS.

No later than January 31st of every year the Calico Solar Project facility remains in operation, provide the CPM and BLM an annual Listed Species Status Report

as described above, and a summary of desert tortoise exclusion fence inspections and repairs conducted in the course of the year.

REVEGETATION PLAN AND COMPENSATION FOR IMPACTS TO NATIVE VEGETATION COMMUNITIES

BIO-10 The project owner shall provide restoration/compensation for impacts to native vegetation communities and develop and implement a Revegetation Plan for all areas subject to temporary project disturbance, including but not limited to linear features and berms of detention or debris basins, to the extent permitted by stormwater control requirements. Upon completion of construction, all temporarily disturbed areas shall be restored to pre-project grade and revegetated according to the measures described below. Temporarily disturbed areas within the project area include, but are not limited to: all areas where underground infrastructure was installed, temporary access roads, construction work temporary lay-down areas, and construction equipment staging areas. For the purpose of this mitigation measure, "temporarily disturbed areas" shall include disturbances that are considered permanent impacts in the analyses above (i.e., would take more than 5 years to recover) but would benefit from the revegetation activities identified here. The following measures shall be implemented for all temporarily disturbed areas, excluding areas immediately around facilities which may be landscaped according to a separate Landscape Plan. These measures will include:

1. Plan Details. The plans shall include at minimum: (a) locations and details for top soil storage; (b) methods to salvage and replant cacti, yucca or other species described in **BIO-12** Section E, or to plant out nursery stock of these species onto revegetation sites; (c) seed collection guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology if used; (g) measures to control exotic vegetation on site; (h) performance standards (see below); and (i) a detailed monitoring program. All habitats dominated by non-native species prior to project disturbance shall be revegetated using appropriate native species. This plan shall also contain contingency measures for failed restoration efforts (efforts not meeting success criteria).

2. Topsoil Salvage. Topsoil shall be stockpiled from the project site for use in revegetation of the disturbed soils. The topsoil excavated shall be segregated, kept intact, and protected, under conditions shown to sustain seed bank viability. The upper 1 inch of topsoil which contains the seed bank shall be scraped and stockpiled for use as the top-dressing for the revegetation area. An additional 6 to 8 inches of soil below the top 1 inch of soil shall also be scraped

and separately stockpiled for use in revegetation areas. Topsoil shall be replaced in its original vertical orientation following ground disturbance, ensuring the integrity of the top one inch in particular. All other elements of soil stockpiling shall be conducted as described on pages 39-40 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003).

3. Seed and Nursery Stock. Only seed or potted nursery stock of locally occurring native species shall be used for revegetation. Seeds shall contain a mix of short-lived early pioneer species such as native annuals and perennials and subshrubs. Seeding and planting shall be conducted as described in Chapter 5 of *Rehabilitation of Disturbed Lands in California* (Newton and Claassen 2003). A list of plant species suitable for Mojave Desert region revegetation projects, including recommended seed treatments, are included in Appendix A-8 of the same report. The list of plants observed during the 2010 special-status plant surveys of the Project area can also be used as a guide to site-specific plant selection for revegetation. In conformance with BLM policy, the project owner shall include salvaged or nursery stock yucca (all species), cacti (excluding cholla species, genus *Cylindropuntia),* smoke tree, mesquites, and desert ironwood in revegetation plans and implementation, as described in **BIO-12** Section E.

4. Monitoring Requirement and Performance Standards. Post-seeding and planting monitoring will be yearly and shall continue for a period of no less than 10 years or until the defined performance standards are achieved (whichever is later). Remediation activities (e.g., additional planting, removal of non-native invasive species, or erosion control) shall be taken during the 10-year period if necessary to ensure the success of the restoration effort. If the mitigation fails to meet the established performance standards after the 10-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the 10-year period until the performance standards are met, unless otherwise specified by the Energy Commission and BLM. As needed to achieve performance standards, the project owner shall be responsible for replacement planting or other remedial action as agreed to by BLM and CPM. Replacement plants shall be monitored with the same survival and growth requirements as required for original revegetation plantings. The following performance standards must be met by the end of the monitoring period: (a) at least 80% of the species and vegetative cover observed within the temporarily disturbed areas shall be native species that naturally occur in desert scrub habitats; (b) absolute cover and density of native plant species within the revegetated areas shall equal at least 60% of the pre-disturbance or reference vegetation cover; and (c) the site shall have gone

without irrigation or remedial planting for a minimum of three years prior to completion of monitoring.

5. If a fire or flood damages a revegetation area within the 10-year monitoring period, the owner shall be responsible for a one-time replacement. If a second fire or flood occurs, no replanting is required, unless the event is caused by the owner's activity (e.g., as determined by BLM or other firefighting agency investigation).

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Within 90 days after completion of each year of project construction, the project owner shall provide to the CPM verification of the total vegetation acreage subject to temporary and permanent disturbance. To monitor and evaluate the success of the revegetation, the project owner shall submit annual reports of the revegetation including the status of the site, percent cover of native and exotics, and any remedial actions conducted by the owner to the CPM and BLM Wildlife Biologist.

No less than 30 days following the publication of the Energy Commission License Decision or the Record of Decision/ROW Issuance, whichever comes first, the project owner shall submit to the CPM and BLM's Wildlife Biologist a final agency-approved Revegetation Plan that has been reviewed and approved by BLM's Wildlife Biologist and the CPM. The Plan shall include a Plant Salvage and Replacement Section as described in **BIO-12** Section E. All modifications to the Revegetation Plan shall be made only after approval from BLM's Wildlife Biologist and the CPM.

Within 30 days after completion of each year of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the Revegetation Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding.

On January 31st of each year following construction until the completion of the revegetation monitoring specified in the Revegetation Plan, the Designated Biologist shall provide a report to the CPM and BLM's Wildlife Biologist that includes: a summary of revegetation activities for the year, a discussion of whether revegetation performance standards for the year were met; and recommendations for revegetation remedial action, if warranted, are planned for the upcoming year.

WEED MANAGEMENT PLAN

BIO-11 The project owner shall revise and implement a Weed Management Plan that meets the approval of BLM and CPM. The draft Noxious Weed Management Plan submitted by the applicant shall provide the basis for the final plan, subject to review and revisions from BLM, USFWS, CDFG, and the CPM.

The final plan shall include weed control measures with demonstrated records of success, based on the best available information from sources such as: The Nature Conservancy's The Global Invasive Species Team, Cooperative Extension, California Invasive Plant Council http://www.cal-ipc.org/ip/ management/plant profiles/index.php, and the California Department of Food & Agriculture Encycloweedia: http://www.cdfa.ca.gov/phpps/ipc/encycloweedia/ encycloweedia hp.htm. The methods shall meet the following criteria:

1. Manual: well-timed removal of plants or seed heads with hand tools; seed heads and plants must be disposed of in accordance with guidelines from the Riverside County Agricultural Commissioner.

2. Chemical: Herbicides known to have residual toxicity, such as pre-emergents and pellts, shall not be used in natural areas or within the engineered channels. Only the following application methods may be used: wick (wiping onto leaves); inner bark injection; cut stump; frill or hack & squirt (into cuts in the trunk); basal bark girdling; foliar spot spraying with backpack sprayers or pump sprayers at low pressure or with a shield attachment to control drift, and only on windless days, or with a squeeze bottle for small infestations.

   In addition to describing weed eradication and control methods, and a reporting plan for weed management during and after construction, the final Weed Management Plan shall include at least the following Best Management Practices to prevent the spread and propagation of weeds:

   - Limit the extent of any vegetation and/or ground disturbance to the absolute minimum needed, and limit ingress and egress to defined routes.

   - Install and maintain vehicle wash and inspection stations and closely monitor the types of materials brought onto the site.

   - Reestablish vegetation on disturbed sites with native seed mixes (measures and performance standards to be consistent with Revegetation Plan, described in Condition of Certification **BIO-10**).

   - Monitoring and timely implementation of control measures to ensure early detection and eradication for weed invasions. Weed infestations must be controlled or eradicated as soon

as possible upon discovery, and before they go to seed, to prevent further expansion.

- Use only weed-free straw or hay bales used for sediment barrier installations, and weed-free seed.

- Reclamation and revegetation shall occur on all temporarily disturbed areas, including, but not limited to, transmission lines, temporary access roads, construction work temporary lay-down areas, and staging areas.

- Control weeds in areas where irrigation and mirror washing take place.

- Prohibit disposal of mulch or green waste from mown weed infestations around the solar generators to prevent inadvertent introduction and spread of invasive plants beyond the immediate vicinity of the project area and possibly into rare plant populations off-site. Mulch or green waste shall be removed from the site in a covered vehicle to prevent seed dispersal, and transported to a landfill or composting facility.

- Indicate where herbicides may be used, which herbicides, and specify techniques to be used to avoid chemical drift or residual toxicity to special-status plants, consistent with guidelines provided by the Nature Conservancy's The Global Invasive Species Team

  (http://www.invasive.org/gist/products. html).

- Avoid herbicide use or other control methods in or around Environmentally Sensitive Areas (ESAs, see Condition of Certification **BIO-12)** on-site or off-site; prevent any herbicide drift into ESAs.

From the time construction begins and throughout the life of the project, surveying for new invasive weed populations and the monitoring of identified and treated populations shall be required within the project area and surrounding 250-foot buffer area. See also requirements for weed monitoring and treatment in the adjacent Pisgah Crater ACEC described in Condition of Certification **BIO-12.** Surveying and monitoring for weed infestations shall occur annually. Treatment of all identified weed populations shall occur at a minimum of once annually. When no new seedlings or resprouts are observed at treated sites for three consecutive, average rainfall years, the weed infestation at that site

can be considered eradicated and weed control efforts, but not annual monitoring, may cease for that impact site.

Verification: At least 30 days prior to start of any project-related ground disturbance activities, the project owner shall provide the BLM's Wildlife Biologist and the CPM with the revised Weed Management Plan. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize the Weed Management Plan. Any further modifications to the approved Weed Management Plan shall be made only after consultation with the CPM and BLM's Wildlife Biologist , in consultation with USFWS and CDFG. Within 30 days after completion of project construction, the project owner shall provide to the BLM's Wildlife Biologist and the CPM for review and approval, a written report identifying which items of the Weed Management Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding. A summary report on weed management on the project site shall be submitted in the Annual Compliance Report during plant operations.

SPECIAL-STATUS PLANT IMPACT AVOIDANCE AND MINIMIZATION

BIO-12 This condition contains the following five sections:

- **Section A: White-margined Beardtongue Avoidance and Minimization Measures** describes measures to protect all white-margined beardtongue plants located within the project area or within 250 feet of its boundaries (including access roads, staging areas, laydown areas, parking and storage areas) from accidental and indirect impacts during construction, operation, and closure.
- **Section B: Conduct Late Season Botanical Surveys** describes guidelines for conducting summer-fall surveys to detect special-status plants that may have been missed during the spring surveys.
- **Section C: Mitigation Requirements for Special-Status Plants Detected in the Summer/Fall Surveys** outlines the level of avoidance required for plants detected during the summer-fall surveys, based on the species' rarity and conservation status. Avoidance is based on extent of local occurrences on the project site and, as applicable, extending onto contiguous public land. Where avoidance would result in on-site isolation of plant occurrences from essential ecological processes, or would cause local populations to become inviable, then off-site compensation would be allowed.
- **Section D: Off-Site Compensatory Mitigation for Special-Status Plants** describes performance standards for mitigation for a range of options for compensatory mitigation through acquisition, restoration/enhancement, or a combination of acquisition and restoration/enhancement, based on the species' rarity and conservation status.

- **Section E: Plant Salvage** describes measures to include potted nursery stock or salvaged specimens of certain cacti, yucca, and other species listed in San Bernardino County plant protection policies in revegetation plans, in conformance with BLM policy.

"Project Disturbance Area" encompasses all areas to be temporarily and permanently disturbed by the Project, including the plant site, linear facilities, and areas disturbed by temporary access roads, fence installation, construction work lay-down and staging areas, parking, storage, or by any other activities resulting in disturbance to soil or vegetation. Nothing in this condition requires the project owner to conduct botanical surveys on private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission.

The Project owner shall implement the following measures in Section A, B, C, D and E to avoid, minimize, and compensate for impacts to certain special-status plant species, based on species rarity and conservation status:

Section A: White-margined Beardtongue Avoidance and Minimization Measures

To protect all white-margined beardtongue plants located within the project area or within 250 feet of its boundaries (including access roads, staging areas, laydown areas, parking and storage areas) from accidental and indirect impacts during construction, operation, and closure, the Project owner shall implement the following measures:

1. Designated Botanist. An experienced botanist who meets the qualifications described in Section **B-2** below shall oversee compliance with all special-status plant avoidance, minimization, and compensation measures described in this condition throughout construction, operation, and closure. The Designated Botanist shall oversee and train all other Biological Monitors tasked with conducting botanical survey and monitoring work.
2. White-margined Beardtongue Impact Avoidance and Minimization Plan. The Project owner shall prepare and implement a White-margined Beardtongue Impact Avoidance and Minimization Plan and shall incorporate the Plan into the BRMIMP (**BIO-7**). The Plan shall be designed to prevent direct or indirect effects of project construction and operation to all white-margined beardtongue occurrences within the project boundary, and to any other special status plants including small-flowered androstephium located within

Environmentally Sensitive Areas (defined below). The Plan shall include the following elements:

a. Designate Environmentally Sensitive Areas (ESAs). Before construction, designate ESAs to protect all known white-margined beardtongue locations on the project site or within 250 feet of site boundaries. The ESAs shall include, at minimum, the approximately 18 acres of white-margined beardtongue occurrences as identified on Applicant's Exhibit 57, Alternative Site Layout #2. The locations of ESAs shall be clearly depicted on construction drawings, which shall also include all avoidance and minimization measures on the margins of the construction plans. The boundaries of the ESAs shall provide a minimum of 250 feet buffer area between white-margined beardtongue plant locations and any ground-disturbing project activity. The ESAs shall be clearly delineated in the field with permanent fencing and signs prohibiting movement of the fence under penalty of work stoppages and additional compensatory mitigation. ESAs shall also be permanently marked (with signage or other markers) to ensure that avoided plants are not inadvertently harmed during construction, operation, or closure.

b. Baseline data. Document baseline conditions, including numbers and areal extent of white-margined beardtongue and any other special-status plant occurrences within the ESAs;

c. Success criteria. Specify success standards for protection of special-status plant occurrences within the ESAs, and identify specific triggers for remedial action (e.g., numbers of plants dropping below a threshold);

d. Literature review. Describe and reference any available information about microhabitat preferences and fecundity, essential pollinators, reproductive biology, and propagation and culture requirements for white-margined beardtongue and any other special-status species within the ESAs;

e. Protection and avoidance measures. Describe measures (e.g., fencing, signage) to avoid direct and indirect construction and operation impacts to special-status plants within the ESAs; these shall include but shall not be limited to: (1) training components specific to protection of white-margined beardtongue and surrounding habitat buffer area, which shall be incorporated into the WEAP described in **BIO-6**; (2) detailed specifications for avoiding herbicide and soil stabilizer drift, and shall include a list of herbicides and soil

stabilizers that may be used on the Project with manufacturer's guidance on appropriate use; the Plan shall reference the Weed Management Plan (see Condition of Certification **BIO-11**) and shall be consistent with provisions of that Plan; (3) measures to ensure that erosion and sediment control do not inadvertently impact special-status plants located within an ESA (e.g., by using invasive or non-native plants in seed mixes, introducing pest plants through contaminated seed or straw, etc.). Where applicable, these measures shall be incorporated in the Weed Management Plan and Storm Water Pollution Prevention Plan. Also, designate spoil areas; equipment, vehicle, and materials storage areas; parking; equipment and vehicle maintenance areas, and; wash areas at least 100 feet from boundaries of any ESAs;

f. Monitoring and Reporting Requirements. The Designated Botanist shall conduct weekly monitoring of the ESAs during any construction or decommissioning activities within 100 feet of the ESAs, and quarterly monitoring for the remainder of construction and during operations. For the life of the project, the Project owner shall also conduct annual monitoring of the avoided occurrences within ESAs on-site, and off-site occurrences that are within 250 feet from the project boundary and are located on public lands or on private lands to which the Applicant has access. The project owner shall make reasonable attempts to obtain permission to enter adjacent private property for the purpose of rare plant monitoring (see Verification, below).

g. Remedial Action Measures. Specify remedial action measures to be implemented if success standards (above) are not met at any time during the life of the project;

h. Seed Collection. Over the life of the project, the project owner shall collect a small proportion of any available seed produced by white-margined beardtongue plants protected on-site within ESAs on an annual basis until propagation research (below) is complete and seed bank curators agree that sufficient seed has been placed into long-term storage. Seed collection must only be done under permit from the BLM; the project owner shall be responsible for obtaining and complying with applicable permit(s). The collection technique shall follow seed collection and storage guidelines contained in (Wall 2009a; Bainbridge 2007). Collection of seed shall be done by the Rancho Santa Ana Botanic Garden (RSABG) Conservation Program staff or other qualified seed or restoration specialist. The Project owner

shall be responsible for all costs associated with seed collection and storage. All seed storage shall occur at RSABG or other qualified research institution and at least 40 percent of the collected seed shall remain in long-term storage at RSABG Seed Conservation Program, San Diego Natural History Museum, or other qualified seed conservation program. In the event that construction schedules or seed production prevent collection within ESAs on-site, the applicant must substitute off-site seed collection site as approved by the CPM in consultation with the BLM State Botanist;

i. Propagation research. The project owner shall be responsible for evaluating potential white-margined beardtongue propagation and reintroduction methods with the objective of developing horticultural techniques suitable for eventual introduction of nursery-grown white-margined beardtongue on-site or off-site as remedial action measures if needed (paragraph g., above); a portion of seed (paragraph h., above) shall be made available for propagation research which may at some time inform contingency propagation efforts on the project site or elsewhere; propagation experimentation shall be funded by the project owner and conducted by a qualified research institution such as Rancho Santa Ana Botanic Garden and the results shall not be subject to a non-disclosure agreement. At minimum, propagation research shall include germination and seedling establishment trials under a variety of soil and humidity conditions reflecting the range of seasonal conditions found in the plant's natural habitat on the project site; plant growth from seedling to nursery stock size; and transplantation methods. These trials shall be conducted in part within growth chambers where temperature and humidity are controlled and in part on the project site or adjacent Pisgah ACEC under natural conditions.

j. Off-site sand transport monitoring and management. The White-margined Beardtongue Impact Avoidance and Minimization Plan shall include a sand transport monitoring and management to document and manage project effects to eastward sand transport to occupied white-margined beardtongue aeolian sand habitat off-site to the east. At minimum, the plan shall include the following elements (1) quantify baseline eastward sand transport from the project area into the adjacent BLM Pisgah Crater ACEC, following methods described by Etyemezian et al. (2010); (2) specify methods and schedule for annual sand transport monitoring

throughout the first five years of the project's life; (3) identification of thresholds which would trigger remediation requirements; and (4) development of adaptive management strategies to supplement eastward sand transport into the ACEC if needed. These strategies may include revisions to project fencing design, importing sand from off-site or transporting sand across the project site for further dispersal. No sand transport remediation work would be permitted to cause new land disturbance outside the project area as analyzed in this SSA.

k. Off-site weed monitoring and management. The White-margined Beardtongue Impact Avoidance and Minimization Plan shall include methods and schedule to monitor and manage weed abundance in occupied and suitable white-margined beardtongue habitat to the east. At minimum, the plan shall (1) quantify baseline weed abundance in the portion of the ACEC adjacent BLM Pisgah Crater ACEC, adjacent to and within 500 m of the eastern project boundary, north of the BNSF railroad tracks; (2) weed abundance monitoring schedule and methods to implement throughout that area by collecting and analyzing quantitative weed abundance during every year of average or greater rainfall throughout the life of the project; (3) identify weed abundance thresholds which would trigger remediation requirements; and (4) specify weed control methods to be implemented as needed in occupied and suitable white-margined beardtongue habitat throughout the area described above.

Section B: Conduct Late-Season Botanical Surveys

The Project owner shall conduct late-summer/fall botanical surveys for late-season special-status plants as described below:

1. Survey Timing. To the extent feasible, surveys shall be timed to detect: a) summer annuals triggered to germinate by the warm, tropical summer storms (which may occur any time between June and October), and b) fall-blooming perennials that respond to the cooler, later season storms that originate in the Pacific northwest (typically beginning in September or October), if identification may require leaves, flowers, or other structures not available during spring surveys previously completed. The survey dates shall be based on plant phenology and the timing of a significant storm (i.e., a 10 mm or greater rain or multiple storm events of sufficient volume to trigger germination, as measured at or within 1 mile of the Project site) if an event is recorded. Surveys for summer annuals shall be timed as needed and feasible to identify target

species (below), based upon field visits to reference populations. However, due to the undependable nature and scattered patterns of summer and early fall rainfall, it is possible that no suitable rain event will be documented in the area. Nevertheless, the project own shall be responsible for conducting late-season botanical surveys along washes and other lowland areas on-site due to the possibility that rainstorms in the Cady Mountains may go undetected, but may initiate summer or fall blooms. In 2010, summer/fall late-season botanical surveys shall be completed throughout the project areas designated as Phases 1a and 1b and throughout washes and drainageways of project areas designated as Phase 2. Additional surveys throughout all of the Phase 2 area shall be completed during 2010 or a subsequent year, but prior to construction of that phase.

2. Surveyor Qualifications and Training. Surveys shall be conducted by a qualified botanist knowledgeable in the complex biology of the local flora, and consistent with CDFG (2009) and BLM (2009) protocols. The botanical survey crew shall be prepared to mobilize quickly to conduct appropriately timed surveys. Each field botanist shall be equipped with a GPS unit and record a complete tracklog; these data shall be compiled and submitted along with the Summer-Fall Survey Botanical Report (described below). Prior to the start of surveys, all crew members shall, at a minimum, visit target species reference sites (where available) and/or review herbarium specimens to confirm detectability and obtain a search image.

3. Target Species. Field surveys shall be designed and scheduled to locate target species, defined as all BLM Sensitive plants, CNPS List 1B or 2 (Nature Serve rank S1 and S2) or proposed List 1B or 2 taxa, and any newly reported or documented taxa. Because the potential for range extensions is unknown, the list of potentially occurring special-status plants shall include all special-status taxa known from comparable habitats in the central portion of the Mojave Desert in California. At a minimum, ~~T~~the list shall include all summer or fall-flowering species identified as potentially occurring on the site in the applicant's spring 2010 botanical survey report (TS 2010i) and by Andre (2010, Intervenor Defenders of Wildlife Rebuttal Testimony). Determination of flowering season shall be based upon field visits to reference populations and data available online from the Consortium of California Herbaria and California Native Plant Society. Target species also shall include taxa with bloom seasons that begin in fall and extend into the early spring as many of these are reported to be easier to detect in fall, following the start of the fall rains.

4. Survey Coverage. At a minimum, the Applicant shall conduct comprehensive surveys (i.e., 100 percent visual coverage) of the washes, dune swales, and other lowlands within the project site. In the intervening uplands (e.g., bajadas and rock outcrops) surveys shall be conducted to ensure a 25 percent visual coverage. Other special or unique habitats associated with rare plants (such as dunes, washes, and chenopod scrubs) shall also be surveyed at 100 percent visual coverage. Transects shall be "intuitive controlled" (per BLM 2009b) to ensure a focus on habitat most likely to support rare plants (such as desert washes or dunes), rather than on pre-defined, evenly-spaced survey grids.

5. Documenting Occurrences. If a special-status plant is detected, the full extent of the population onsite shall be recorded using GPS in accordance with BLM survey protocols. Additionally, the extent and density of the occupied habitat within one mile of project boundaries shall be assessed at least qualitatively to facilitate an accurate estimation of the proportion of the occurrence affected by the project. For occurrences that are very dense or very large, the plant numbers may be estimated by simple sampling techniques and the survey report must provide qualitative or quantitative data describing the density and roughly mapping the extent on a topographic map. All but the smallest populations (e.g., a population occupying less than 100 square feet) shall be recorded as area polygons; small populations may be recorded as point features. All GPS-recorded occurrences shall include: the number of plants, phenology, observed threats (e.g., OHV or invasive exotics), and habitat or community type. The map of occurrences, to be submitted with the final botanical report, shall be prepared to ensure consistency with mapping protocol and definitions of occurrences in CNDDB: occurrences found within 0.25 miles of another occurrence of the same taxon, and not separated by significant habitat discontinuities, shall be combined into a single 'occurrence.' The Project Owner shall also submit the raw GPS shape files and metadata, and completed CNDDB forms to CNDDB for each occurrence as defined by CNDDB.

6. Reporting. Raw GPS data, metadata, and CNDDB field forms shall be provided to the CPM within two weeks of completion of each survey. If field surveys take place during two or more phases (e.g., late summer and fall), then a summary letter shall be submitted following each survey.

   The Final Summer-Fall Botanical Survey Report shall be prepared consistent with CDFG guidelines (CDFG 2009), and BLM guidelines (2009) and shall include the following components:

a. the BLM designation, NatureServe Global and State Rank of each species or taxon found (or proposed rank, or CNPS List);

b. the number or percent of the occurrence that will be directly affected, and indirectly affected by changes in drainage patterns or altered geomorphic processes;

c. the habitat or plant community that supports the occurrence and the total acres of that habitat or community type that occurs in the Project Disturbance Area;

d. an indication of whether the occurrence has any local or regional significance (e.g., if it exhibits any unusual morphology, occurs at the periphery of its range in California, represents a significant range extension or disjunct occurrence, or occurs in an atypical habitat or substrate);

e. a completed CNDDB field form for every occurrence (i.e., the summed locations of a given species within 0.25 mile distance of another location, consistent with CNDDB methodology), and;

f. two maps: one that depicts the raw GPS data (as collected in the field) on a topographic base map with Project features; and a second map that follows the CNDDB protocol for occurrence mapping, which lumps two or more occurrences of the same species within one-quarter mile or less of each other into one occurrence.

Section C: Mitigation Requirements for Special-Status Plants Detected in the Summer/Fall Surveys

The Project owner shall apply the following avoidance standards to special-status plants that might be detected during late summer/fall season surveys. Avoidance and/or the mitigation measures described in Section D below would reduce impacts to special-status plant species to less than significant levels.

Mitigation for CNDDB Rank S1 and S2 Plants: If species with a CNDDB rank of S1 (CDFG 2010b), excluding small-flowered androstephium (CNDDB S1.2), are detected within the Project Disturbance Area or would be directly impacted by discharges from or the diversion of streams around the Project, the Project owner shall implement avoidance measures to protect at least 75 percent of the local occurrence(s) of the species. For perennial species, the local occurrence(s) shall be measured by the number of individual plants located on the Project site or on public lands contiguous to the project site. For annual species, the occurrence(s) shall be measured as areal

extent of contiguous occupied habitat on the site and on contiguous public lands. Avoidance shall include protection of the ecosystem processes essential for maintenance of the protected plant occurrence. Plants located within the ESAs established pursuant to Section A above shall be considered to be "avoided" to the extent that direct impacts on the plants are avoided and that these processes would be maintained. If special status plant occurrences are isolated by the Project from natural fluvial,–aeolian, or other processes known to be necessary for their persistence or reproduction, these occurrences shall not be considered "avoided." This evaluation shall be made in consultation among the project Botanist and the CPM, in consultation with CDFG and BLM, on a case by case basis, dependent on the species and its location on the site. The Project owner shall provide compensatory mitigation as described below in Section D for Project impacts to CNDDB Rank S1 and S2 plants that are not avoided. If, after consultation among the project Botanist, CPM, CDFG, and BLM, on-site avoidance is determined not to satisfy the long-term viability of the plant occurrence(s), then compensatory mitigation may be substituted for avoidance for up to 100% of impacts to Rank S1 and S2 plants on the site, as described below in Section D.

Mitigation for CNDDB Rank S3 Plants: If species with a CNDDB rank of 3 are detected within the Project Disturbance Area, no onsite avoidance or compensatory mitigation shall be required unless the occurrence has local or regional significance, in which case the plant occurrence shall be treated as a CNDDB 2 ranked plant. A plant occurrence would be considered to have local or regional significance if:

a. It occurs at the outermost periphery of its range in California;

b. It occurs in an atypical habitat, region, or elevation for the taxon that suggests that the occurrence may have genetic significance (e.g., that may increase its ability to survive future threats), or;

c. It exhibits any unusual morphology that is not clearly attributable to environmental factors that may indicate a potential new variety or sub-species.

Should CNDDB Rank S3 plant locations meeting any of the three criteria above be found on the project site during summer or fall field surveys, then mitigation requirements for those species shall be as described above for CNDDB Rank S1 and S2 species.

Pre-Construction Notification for State- or Federal-Listed Species, or BLM Sensitive Species. If a state or federal-listed species or BLM Sensitive species is detected, the Project owner shall immediately notify the CDFG, USFWS, BLM, and the CPM.

***Preservation of the Germplasm of Affected Special-Status Plants*.** For all impacts to CNPS List 1 or List 2 plants, excluding small-flowered androstephium, mitigation shall include seed collection from the affected special-status plants on-site prior to construction to conserve the germplasm and provide a seed source for restoration efforts. Where construction schedules or seed availability prevents seed collection from plant locations to be impacted during a given season, seed must be collected from another portion of the project site or, as approved by the CPM in consultation with BLM's State Botanist, from public lands off-site. Seed collection must only be done under permit from the BLM; the project owner shall be responsible for obtaining and complying with applicable permit(s). The seed shall be collected under the supervision or guidance of a reputable seed storage facility such as the Rancho Santa Ana Botanical Garden Seed Conservation Program, San Diego Natural History Museum, or the Missouri Botanical Garden. The costs associated with the long-term storage of the seed shall be the responsibility of the Project owner. Any efforts to propagate and reintroduce special-status plants from seeds in the wild shall be carried out under the direct supervision of specialists such as those listed above and as part of a Habitat Restoration/Enhancement Plan approved by the CPM.

Section D: Off-Site Compensatory Mitigation for Special-Status Plants

Where compensatory mitigation is required under the terms of Section C, above, the Project owner shall mitigate Project impacts to CNPS List 1 or List 2 plants, excluding small-flowered androstephium with compensatory mitigation. Compensatory mitigation shall consist of acquisition of habitat supporting the target species, restoration/enhancement of populations of the target species, or a combination of acquisition and restoration/enhancement as provided within this Condition. Compensatory mitigation shall be at a 3:1 ratio. For annual species, compensation shall provide three acres of habitat acquired or restored/enhanced for every acre of special-status plant habitat disturbed by the Project Disturbance Area. For perennial species, compensation lands shall supporting three living plants of the same species for each plant disturbed within the project area. The Project owner shall provide funding for the acquisition and/or restoration/enhancement, initial improvement, and long-term maintenance and management of the acquired or restored lands. The actual costs to comply with this condition will vary depending on the Project Disturbance Area, the actual costs of acquiring compensation habitat, the actual costs of initially improving the habitat, the actual costs of long-term management as determined by a Property Analysis Record (PAR) or PAR-like analysis, and other transactional costs related to the use of compensatory mitigation.

The Project owner shall comply with other related requirements in this condition:

I. Compensatory Mitigation by Acquisition: The requirements for the acquisition, initial protection and habitat improvement, and long-term maintenance and management of special-status plant compensation lands include all of the following:

Selection Criteria for Acquisition Lands. The compensation lands selected for acquisition may include any of the following three categories:

1. Occupied Habitat, No Habitat Threats: The compensation lands selected for acquisition shall be occupied by the target plant species and shall be characterized by site integrity and habitat quality that are required to support the target species, and shall be of equal or better habitat quality than that of the affected occurrence.
2. Occupied Habitat, Habitat Threats. Occupied compensation lands characterized by habitat threats may also be acquired as long as the population could be reasonably expected to recover with minor restoration (e.g., OHV or grazing exclusion, pest plant removal) and is accompanied by a Habitat Enhancement/Restoration Plan as described in Section D.II, below.
3. Unoccupied but Adjacent. The Project owner may also acquire habitat for which occupancy by the target species has not been documented, if the proposed acquisition lands are adjacent to occupied habitat. The Project owner shall provide evidence that acquisitions of such unoccupied lands would improve the defensibility and long-term sustainability of the occupied habitat by providing a protective buffer around the occurrence and by enhancing connectivity with undisturbed habitat.

Review and Approval of Compensation Lands Prior to Acquisition. The Project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for special-status plants in relation to the criteria listed above, and must be approved by the CPM.

Management Plan. The Project owner or approved third party shall prepare a management plan for the compensation lands in consultation with the entity that will be managing the lands. The goal of the management plan shall be to support and enhance the long-term viability of the target special-status plant occurrences. The Management Plan shall be submitted for review and approval to the CPM.

Integrating Special-Status Plant Mitigation with Other Mitigation lands. If all or any portion of the acquired Desert Tortoise, Waters of the State, or

other required compensation lands meets the criteria above for special-status plant compensation lands, the portion of the other species' or habitat compensation lands that meets any of the criteria above may be used to fulfill that portion of the obligation for special-status plant mitigation.

Compensation Lands Acquisition Requirements. The Project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM, has approved the proposed compensation lands:

a. Preliminary Report. The Project owner, or an approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

b. Title/Conveyance. The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement, as required by the CPM. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the CPM. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM of the terms of any transfer of fee title or conservation easement to the compensation lands.

c. Initial Protection and Habitat Improvement. The Project owner shall fund activities that the CPM requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending

on the condition and location of the land acquired, but may include trash removal, construction and repair of fences, invasive plant removal, and similar measures to protect habitat and improve habitat quality on the compensation lands. The costs of these activities are estimated to be $750 per acre ($250 per acre, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a 3:1 ratio, but actual costs will vary depending on the measures that are required for the compensation lands). A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

d. Property Analysis Record. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM before it can be used to establish funding levels or management activities for the compensation lands.

e. Long-term Maintenance and Management Funding. The Project owner shall provide money to establish an account with non-wasting capital that will be used to fund the long-term maintenance and management of the compensation lands. The amount of money to be paid will be determined through an approved PAR or PAR-like analysis conducted for the compensation lands. Until an approved PAR or PAR-like analysis is conducted for the compensation lands, the amount of required funding is initially estimated to be $4,350 for every acre of compensation lands, using as the best available proxy the estimated cost of $1,450 per acre for Desert Tortoise compensatory mitigation, at a 3:1 ratio. This amount may be revised by the CPM in consultation with DFG, BLM and USFWS, based on further analysis of long-term management and maintenance costs. If compensation lands will not be identified and a PAR or PAR-like analysis completed within the time period specified for

this payment (see the verification section at the end of this condition), the Project owner shall either: (i) provide initial payment equal to the amount of $4,350 multiplied by the number of acres the Project owner proposes to acquire for compensatory mitigation; or (ii) provide security to the Energy Commission under subsection (g), "Mitigation Security," below, in an amount equal to $4,350 multiplied by the number of acres the Project owner proposes to acquire for compensatory mitigation. The amount of the required initial payment or security for this item shall be adjusted for any change in the Project Disturbance Area as described above. If an initial payment is made based on the estimated per-acre costs, the Project owner shall deposit additional money as may be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. If the approved analysis indicates less than $4,350 per acquired acre (at a 3:1 ratio) will be required for long-term maintenance and management, the excess paid will be returned to the Project owner. The Project owner must obtain the CPM's approval of the entity that will receive and hold the long-term maintenance and management fund for the compensation lands. The CPM will consult with CDFG before deciding whether to approve an entity to hold the Project's long-term maintenance and management funds.

The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fund holder/manager to ensure the following requirements are met:

i. Interest. Interest generated from the initial capital long-term maintenance and management fund shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action that is approved by the CPM and is designed to protect or improve the habitat values of the compensation lands.

ii. Withdrawal of Principal. The long-term maintenance and management fund principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM or by the approved third-party long-term

maintenance and management fund manager, to ensure the continued viability of the species on the compensation lands.

iii. Pooling Long-Term Maintenance and Management Funds. An entity approved to hold long-term maintenance and management funds for the Project may pool those funds with similar non-wasting funds that it holds from other projects for long-term maintenance and management of compensation lands for special-status plants. However, for reporting purposes, the long-term maintenance and management funds for this Project must be tracked and reported individually to the CPM.

f. Other Expenses. In addition to the costs listed above, the Project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to the title and document review costs incurred from other state agency reviews, overhead related to providing compensation lands to CDFG or an approved third party, escrow fees or costs, environmental contaminants clearance, and other site cleanup measures.

g. Mitigation Security. The Project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing Project activities. Financial assurances shall be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") approved by the CPM. The amount of the Security shall be based upon staff's estimate of per-acre acquisition, transaction, and management costs as described in Condition of Certification BIO-17 for each acre of occupied habitat impacted using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a 3:1 ratio; see **Revised Biological Resources Tables 5** and **7**) for every acre of habitat supporting the target special-status plant species which is significantly impacted by the project. The actual costs to comply with this condition will vary depending on the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a PAR or PAR-like analysis. Prior to submitting the Security to the CPM,

the Project owner shall obtain the CPM's approval of the form of the Security. The CPM may draw on the Security if the CPM determines the Project owner has failed to comply with the requirements specified in this condition. The CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the Security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition, and the Project owner remains responsible for satisfying the obligations under this condition if the Security is insufficient. The unused Security shall be returned to the Project owner in whole or in part upon successful completion of the associated requirements in this condition.

h. The Project owner may elect to comply with the requirements in this condition for acquisition of compensation lands, initial protection and habitat improvement on the compensation lands, or long-term maintenance and management of the compensation lands by funding, or any combination of these three requirements, by providing funds to implement those measures into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs (as set forth in the Security section of this condition) of implementing the requirement. If the actual cost of the acquisition, initial protection and habitat improvements, or long-term funding is more than the estimated amount initially paid by the Project owner, the Project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, and the long-term funding requirements as established in an approved PAR or PAR-like analysis. If those actual costs or PAR projections are less than the amount initially transferred by the applicant, the remaining balance shall be returned to the Project owner.

i. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM

and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the Project.

II. Compensatory Mitigation by Habitat Enhancement/Restoration: As an alternative or adjunct to land acquisition for compensatory mitigation the Project owner may undertake habitat enhancement or restoration for the target special-status plant species. Habitat enhancement or restoration activities must achieve protection at a 3:1 ratio as described above, with improvements applied to three acres of habitat for every acre of special-status plant habitat directly or indirectly disturbed by the Project Disturbance Area for annual species; or to habitat supporting three living plants for each individual perennial plant directly or indirectly disturbed by the project. Examples of suitable enhancement projects include but are not limited to the following: i) control unauthorized vehicle use into an occurrence (or pedestrian use if clearly damaging to the species); ii) control noxious weeds that infest or pose an immediate threat to an occurrence; iii) exclude grazing by wild burros or livestock from an occurrence; or iv) restore lost or degraded hydrologic or geomorphic functions critical to the species by restoring previously diverted flows, removing obstructions to the wind sand transport corridor above an occurrence, or increasing groundwater availability for dependent species.

If the Project owner elects to undertake a habitat enhancement project for mitigation, the project must meet the following performance standards: The proposed enhancement project shall achieve rescue of an off-site occurrence that is currently assessed, based on the NatureServe threat ranking system (Master et al. 2009; Morse et al. 2004) with one of the following threat ranks: a) long-term decline 30%; b) an immediate threat that affects 30% of the population, or c) has an overall threat impact that is High to Very High. "Rescue" would be considered successful if it achieves an improvement in the occurrence trend to "stable" or "increasing" status, or downgrading of the overall threat rank to slight or low (from "High" to "Very High").

If the Project owner elects to undertake a habitat enhancement project for mitigation, they shall submit a Habitat Enhancement/Restoration Plan to the CPM for review and approval, and shall provide sufficient funding for implementation and monitoring of the Plan. The amount of the Security shall be based upon staff's estimate of per-acre acquisition, transaction, and management costs as described in Condition of Certification **BIO-17**–for each acre of occupied habitat impacted by the project, using the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a 3:1 ratio (see **Revised Biological Resources Tables 5** and **7**). The amount of the security may be adjusted based on the actual costs of implementing the

enhancement, restoration and monitoring. The implementation and monitoring of the enhancement/restoration may be undertaken by an appropriate third party such as NFWF, subject to approval by the CPM. The Habitat Enhancement/Restoration Plan shall include each of the following:

1. Goals and Objectives. Define the goals of the restoration or enhancement project and a measurable course of action developed to achieve those goals. The objective of the proposed habitat enhancement plan shall include restoration of a target special-status plant occurrence that is currently threatened with a long-term decline. The proposed enhancement plan shall achieve an improvement in the occurrence trend to “stable” or “increasing” status, or downgrading of the overall threat rank to slight or low (from “High” to “Very High”).
2. Historical Conditions. Provide a description of the pre-impact or historical conditions (before the site was degraded by weeds or grazing or ORV, etc.), and the desired conditions.
3. Site Characteristics. Describe other site characteristics relevant to the restoration or enhancement project (e.g., composition of native and pest plants, topography and drainage patterns, soil types, geomorphic and hydrologic processes important to the site or species.
4. Ecological Factors. Describe other important ecological factors of the species being protected, restored, or enhanced such as total population, reproduction, distribution, pollinators, etc.
5. Methods. Describe the restoration methods that will be used (e.g., invasive exotics control, site protection, seedling protection, propagation techniques, etc.) and the long-term maintenance required. The implementation phase of the enhancement must be completed within five years.
6. Budget. Provide a detailed budget and timeline; develop clear, measurable, objective-driven annual success criteria.
7. Monitoring. Develop clear, measurable monitoring methods that can be used to evaluate the effectiveness of the restoration and the benefit to the affected species. The Plan shall include a minimum of five years of quarterly monitoring, and then annual monitoring for the remainder of the enhancement project, or until the performance standards for rescue of a threatened occurrence are met, whichever comes first. At a minimum the progress reports shall include: quantitative measurements of the projects progress in meeting the enhancement project success criteria, detailed description of remedial actions taken or proposed, and contact information for the responsible parties.
8. Reporting Program. The Plan shall ensure accountability with a reporting program that includes progress toward goals and success criteria. Include names of responsible parties.

9. Contingency Plan. Describe the contingency plan for failure to meet annual goals.

10. Long-term Protection. Include proof of long-term protection for the restoration site. For private lands this would include conservations easements or other deed restrictions; projects on public lands must be contained in a Desert Wildlife Management Area, Wildlife Habitat Management Area, or other land use protections that will protect the mitigation site and target species.

Section E: Conformance with BLM and San Bernardino County Plant Protection Policies

It is BLM policy to salvage yucca and cactus plants (excluding cholla species, genus *Cylindropuntia*) and transplant them to undisturbed sites within project Rights of Way. The San Bernardino County Plant Protection and Management Ordinance regulates the following where they occur on non-government land (San Bernardino County Code 88.01): desert native plants with stems 2 inches or greater in diameter or 6 feet or greater in height: *Psorothamnus* [*Dalea*] *spinosa* (smoke tree), *Prosopis* spp. (mesquites), all species of the family Agavaceae (century plants, nolinas, yuccas), creosote rings 10 feet or greater in diameter, all Joshua trees; and any part of any of the following species, whether living or dead: *Olneya tesota* (desert ironwood), all species of the genus *Prosopis* (mesquites), and all species of the genus *Cercidium* (palo verdes). Staff recognizes that the project site is on public land and thus not strictly subject to the County ordinance—but believes the County ordinance establishes an additional mitigation standard that should be applied to the project, as follows:

a. The project owner shall inventory all plants subject to BLM and County policies on the project site that would be removed or damaged by proposed project construction.

b. The project owner shall include salvaged plants or potted nursery stock of any species named in BLM or County policies in on-site revegetation planning and implementation, as described in **BIO-10**. The project owner shall include a Protected Plant Salvage and Replacement Section in the Revegetation Plan, in conformance with BLM. The Section also shall provide for incorporation of salvaged or potted stock of any species identified in the San Bernardino County standards that would be impacted by project development affected. The Section shall be made available for review and approval by the CPM. For salvaged plants, the Section shall include detailed descriptions of proposed methods to salvage plants; transport them; store them temporarily (as needed); and maintain them in temporary storage (i.e., irrigation, shade protection, etc.). For both salvaged plants and potted nursery stock, the Section shall include detailed descriptions of proposed planting locations and

methods; proposed irrigation and maintenance methods at planting sites; and a monitoring plan to verify survivorship and establishment of the plants for a minimum of five years.

c. Concurrent with any ground-disturbing activities within any phase of the project, the project owner shall implement the Protected Plant Replacement measures as approved by the CPM and BLM's State Botanist.

Verification: The Special-Status Plant Impact Avoidance and Minimization Measures shall be incorporated into the BRMIMP as required under Condition of Certification **BIO-7**.

Implementation of the special-status plant impact avoidance and minimization measures shall be reported in the Monthly Compliance Reports prepared by the Designated Botanist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval in consultation with the BLM State Botanist, a written construction termination report identifying how measures have been completed.

The Project owner shall submit a monitoring report every year for the life of the project to monitor effectiveness of protection measures for all avoided special-status plants to the CPM and BLM State Botanist. The monitoring report shall include: dates of worker awareness training sessions and attendees, an inventory of the special-status plant occurrences and description of the habitat conditions, an indication of population and habitat quality trends, and description of the remedial action, if warranted and planned for the upcoming year.

Section A. No less than 30 days prior to the start of ground-disturbing activities the Project owner shall submit grading plans and construction drawings depicting the location of Environmentally Sensitive Areas and the Avoidance and Minimization Measures contained in Section A of this Condition. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize boundaries of the ESAs. The 30 day limit may be reduced by the CPM.

No less than 30 days prior to the start of ground-disturbing activities the Project owner shall submit to the CPM for review and approval, in consultation with the BLM State Botanist, the name and resume of the project's Designated Botanist. If a Designated Botanist needs to be replaced, the specified information of the proposed replacement must be submitted to BLM's Wildlife Biologist and the CPM as soon as possible prior to the termination or release of the Designated Biologist. In an emergency, the project owner shall immediately notify the BLM's Wildlife Biologist and the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Botanist is proposed to BLM's Wildlife Biologist and the CPM and for consideration. The 30 day limit may be reduced by the CPM.

No less than 30 days prior to ground-disturbing activities the Project owner shall submit a draft White-margined Beardtongue Impact Avoidance and Minimization Plan to the CPM for review and approval, in consultation with the BLM State Botanist. Implementation of the white-margined beardtongue impact avoidance and minimization measures shall be reported in the Monthly Compliance Reports prepared by the Designated Botanist. Within 30 days after completion of Project construction, the Project owner shall provide to the CPM, for review and approval in consultation with the BLM State Botanist, a written construction termination report identifying how measures have been completed. The 30 day limit may be reduced by the CPM.

The Project owner shall submit a monitoring report every year for the life of the project to monitor effectiveness of protection measures for all avoided white-margined beardtongue ESAs to the CPM and BLM State Botanist. The monitoring report shall include: dates of worker awareness training sessions and attendees, an inventory of the special-status plant occurrences and description of the habitat conditions, an indication of population and habitat quality trends, and description of the remedial action, if warranted and planned for the upcoming year. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize monitoring reports and all reports described in this section, and shall specifically report any difficulties in meeting the protection goals and cooperatively develop adaptive measures as needed.

Section B. Raw GPS data, metadata, and CNDDB field forms shall be submitted to the CPM within two weeks of the completion of each survey. A preliminary summary of results for the late summer/fall botanical surveys shall also be submitted to the CPM and BLM's State Botanist within two weeks following the completion of the surveys. If surveys are split into more than one period, then a summary letter shall be submitted following each survey period. The Final Summer-Fall Botanical Survey Report, GIS shape files and metadata shall be submitted to the BLM State Botanist and the CPM no less than 30 days prior to the start of ground-disturbing activities. The Final Report shall include a detailed accounting of the acreage of Project impacts to special-status plant occurrences.

Section C. The Project owner shall immediately provide written notification to the CPM, CDFG, USFWS, and BLM if it detects a State- or Federal-Listed Species, or BLM Sensitive Species at any time during its late summer/fall botanical surveys or at any time thereafter through the life of the Project, including conclusion of Project decommissioning.

Prior to construction, the project owner shall provide written verification that seed of any special status plants on the project site have collected and conveyed to a facility (as described in this measure) and that suitable long-term funding has been provided by the project owner. As needed, the project owner shall consult with the CPM and BLM's State Botanist to identify appropriate seed collection sites and dates.

Section D. If compensatory mitigation is required (based upon field survey results and mitigation strategy adopted by the project owner, as described in Sections C and D), no less than 30 days prior to the start of ground-disturbing activities, the Project owner shall submit to the CPM Security adequate to acquire compensatory mitigation lands and/or undertake habitat enhancement or restoration activities, as described in this condition. The 30 day limit may be reduced by the CPM.

No fewer than 90 days prior to acquisition of compensatory mitigation lands, the Project owner shall submit a formal acquisition proposal and draft Management Plan for the proposed lands to the CPM, with copies to CDFG, USFWS, and BLM, describing the parcels intended for purchase and shall obtain approval from the CPM prior to the acquisition. No fewer than 90 days prior to acquisition of compensatory mitigation lands, the Project owner shall submit to the CPM and obtain CPM approval of any agreements to delegate land acquisition to an approved third party, or to manage compensation lands; such agreement shall be executed and implemented within 18 months of the Energy Commission's certification of the Project.

The Project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the CPM of such completion no later than 18 months after the start of Project ground-disturbing activities. If NFWF or another approved third party is being used for the acquisition, the Project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline. If habitat enhancement is proposed, no later than six months following the start of ground-disturbing activities, the Project owner shall obtain CPM approval of the final Habitat Enhancement/Restoration Plan, prepared in accordance with Section D, and submit to the CPM or a third party approved by the CPM Security adequate for long-term implementation and monitoring of the Habitat Enhancement/Restoration Plan.

Enhancement/restoration activities shall be initiated no later than 12 months from the start of construction. The implementation phase of the enhancement project shall be completed within five years of initiation. Until completion of the five-year implementation portion of the enhancement action, a report shall be prepared and submitted as part of the Annual Compliance Report. This report shall provide, at a minimum: a summary of activities for the preceding year and a summary of activities for the following year; quantitative measurements of the Project's progress in meeting the enhancement project success criteria; detailed description of remedial actions taken or proposed; and contact information for the responsible parties.

Within 18 months of ground-disturbing activities, the Project owner shall transfer to the CPM or an approved third party the difference between the Security paid and the actual costs of (1) acquiring compensatory mitigation lands, completing

initial protection and habitat improvement , and funding the long-term maintenance and management of compensatory mitigation lands; and/or (2) implementing and providing for the long-term protection and monitoring of habitat enhancement or restoration activities.

Section E. The project owner shall coordinate with the CPM and BLM's Wildlife Biologist to revise and finalize all plans and reports named in this section. Verification and reporting shall be as described in **BIO-10** and shall be included in reports described therein. Within 90 days after completion of each year of project construction, the project owner shall provide to the CPM verification of the numbers or acreage of plants covered in this Condition (i.e., species named in BLM and County policies) which have been removed or salvaged over the course of the year. Annual revegetation reports described in **BIO-10** verification shall include summaries of salvage and planting operations and monitoring results. Compliance reports shall include summaries of written and photographic records of the plan implementation described above. Compliance reports shall be submitted annually for a period not less than 5 years to document irrigation, maintenance, and monitoring results, including plant survival.

MOJAVE FRINGE-TOED LIZARD MITIGATION

BIO-13 The project owner shall provide compensatory land to mitigate for habitat loss and direct impacts to Mojave fringe-toed lizards based on revised estimates of suitable Mojave fringe-toed lizard habitat on-site, to be verified by an expert in this animal's ecology. The project owner shall provide compensatory mitigation at a 3:1 ratio for impacts to breeding habitat (i.e., dune, sand ramp, or fine-sandy wash habitat), and at a 1:1 ratio for impacts to adjacent suitable foraging and cover habitat, such as thin aeolian sand overlying bajada surfaces, or foraging habitat surrounding the breeding habitat. Staff estimates breeding habitat on site as 21.4 acres, and surrounding suitable foraging and cover habitat (i.e., 45 meter buffer) as 143.3 acres. Therefore, staff concludes this condition would require the acquisition and dedication in perpetuity of 207.5 acres of habitat. The project owner shall provide funding for the acquisition, initial habitat improvements, and long-term management of the compensation lands, as described below.

Biological Resources Table 17
Mojave Fringe-toed Lizard Compensation Acreage Summary

Habitat Function	Project Impact Acreage	Mitigation Ratio	Compensation Acreage
Foraging and cover	143.3 acres	1:1	143.3 acres
Breeding	21.4 acres	3:1	64.2 acres
Total	164.7 acres		207.5 acres

This compensation acreage may be included ("nested") within the acreage acquired and managed as desert tortoise habitat compensation (Condition of Certification **BIO-17**) only if:

- Adequate acreage of qualifying desert tortoise compensation lands also meet the Selection Criteria (below) as habitat for Mojave fringe-toed lizard;
- The desert tortoise habitat compensation lands are acquired and dedicated as permanent conservation lands within 18 months of the start of project construction.

If these two criteria are not met, then the project owner shall provide the required number of acres of Mojave fringe-toed lizard habitat compensation lands, adjusted to reflect the final project footprint and additional delineation of suitable habitat, independent of any compensation land required under other conditions of certification, and shall also provide funding for the initial improvement and long-term maintenance and management of the acquired lands, and shall comply with other related requirements this condition. Costs of these requirements are estimated to be $674,211.24 based on the acquisition of 207.5 acres (see **Revised Biological Resources Tables 5** and **6** for a complete breakdown of estimated costs). Regardless of actual cost, the project owner shall be responsible for funding all requirements of this condition.

The project owner shall provide financial assurances as described below, in the amount of $660,416.25. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by providing funds for the acquisition to the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as described below. If the Project owner elects to establish a REAT NFWF Account and have NFWF and the resource agencies complete the required habitat compensation, then the total estimated cost of complying with this condition is $674,211.24. The amount of security or NFWF deposit shall be adjusted up or down to reflect any revised cost estimates recommended by REAT.

The actual costs to comply with this condition will vary depending on the final footprint of the Project, the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a Property Analysis Report (below). The 207.5 acre habitat requirement, and associated funding requirements based on that acreage, shall be adjusted up or down if there are changes in the final footprint of the project or the associated costs of evaluation, acquisition, management, and other factors listed in **Revised Biological Resources Tables 5**

and **6**. Regardless of actual cost, the project owner shall be responsible for implementing all aspects of this condition.

COMPENSATORY MITIGATION LAND ACQUISITION

1. Method of Acquisition. Compensation lands shall be acquired by either of the two options listed below. Regardless of the method of acquisition, the transaction shall be complete only upon completion of all terms and conditions described in this Condition of Certification.

a. The project owner shall acquire lands and transfer title and/or conservation easement to a state or federal land management agency or to a third-party non-profit land management organization, as approved by the CPM in consultation with BLM, CDFG, and USFWS; or

b. The Project owner shall deposit funds into a project-specific subaccount within the REAT Account established with the NFWF, in the amount as indicated in **Revised Biological Resources Tables 5** and **6** (adjusted to reflect final project footprint and any applicable REAT adjustments to costs).

2. Selection Criteria for Compensation Lands. The compensation lands selected for acquisition to meet Energy Commission requirements shall:

   a. Be sand dune or partially stabilized sand dune habitat with potential to contribute to Mojave fringe-toed lizard habitat connectivity and build linkages between known populations of Mojave fringe-toed lizards and preserve lands with suitable habitat;

   b. Be biologically contiguous to lands currently occupied by Mojave fringe-toed lizard;

   c. Be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

   d. Provide quality habitat for Mojave fringe-toed lizard, that has the capacity to regenerate naturally when disturbances are removed;

   e. Not have a history of intensive recreational use or other disturbance that might make habitat recovery and restoration infeasible;

   f. Not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under

consideration, that might jeopardize habitat recovery and restoration;

g. Not contain hazardous wastes;

h. Have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with CDFG, BLM and USFWS, agrees in writing to the acceptability of land without these rights; and

i. Be on land for which long-term habitat management for Mojave fringe-toed lizard and other native biological resources is feasible.

3. Review and Approval of Compensation Lands Prior to Acquisition. The project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for Mojave fringe-toed lizard in relation to the criteria listed above and must be approved by the CPM. The CPM will share the proposal with and consult with CDFG, BLM, and the USFWS before deciding whether to approve or disapprove the proposed acquisition.

4. Compensation Lands Acquisition Conditions: The project owner shall comply with the following conditions relating to acquisition of the compensation lands after the CPM, in consultation with CDFG, BLM and the USFWS, have approved the proposed compensation lands:

a. Preliminary Report: The Project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM, in consultation with CDFG, BLM and the USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

b. Title/Conveyance: The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the CPM in consultation with CDFG. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM in consultation with CDFG. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in

favor of CDFG or another entity approved by the CPM. If an approved non-profit holds a conservation easement, CDFG shall be named a third party beneficiary. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM, in consultation with CDFG, of the terms of any transfer of fee title or conservation easement to the compensation lands.

c. Property Analysis Record: Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM, in consultation with CDFG, before it can be used to establish funding levels or management activities for the compensation lands.

5. Compensation Lands Acquisition Costs: The Project owner shall pay all other costs related to acquisition of compensation lands and conservation easements. In addition to actual land costs, these acquisition costs shall include but shall not be limited to the items listed below. Management costs including site cleanup measures are described separately, in the following section.

a. Level 1 Environmental Site Assessment;

b. Appraisal;

c. Title and document review costs;

d. Expenses incurred from other state, federal, or local agency reviews;

e. Closing and escrow costs;

f. Overhead costs related to providing compensation lands to CDFG or an approved third party;

g. Biological survey(s) to determine mitigation value of the land; and

h. Agency costs to accept the land (e.g., writing and recording of conservation easements; title transfer).

COMPENSATORY MITIGATION LAND IMPROVEMENT

1. Land Improvement Requirements: The Project owner shall fund activities that the CPM, in consultation with the CDFG, USFWS and BLM, requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include

surveys of boundaries and property lines, installation of signs, trash removal and other site cleanup measures, construction and repair of fences, invasive plant removal, removal of roads, and similar measures to protect habitat and improve habitat quality on the compensation lands.

The costs of these activities are estimated at $250 an acre, but will vary depending on the measures that are required for the compensation lands. A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

COMPENSATORY MITIGATION LAND LONG-TERM MANAGEMENT

1. Long-term Management Requirements: Long-term management is required to ensure that the compensation lands are managed and maintained to protect and enhance habitat for Mojave fringe-toed lizard. Management activities may include maintenance of signs, fences, removal of invasive weeds, monitoring, security and enforcement, and control or elimination of unauthorized use.

2. Long-term Management Plan. The project owner shall pay for the preparation of a Management Plan for the compensation lands. The Management Plan shall reflect site-specific enhancement measures on the acquired compensation lands. The plan shall be submitted for approval of the CPM, in consultation with CDFG, BLM and USFWS.

3. Long-Term Maintenance and Management Funding. The Project owner shall provide money to establish an account with a non-wasting capital that will be used to fund the long-term maintenance and management of the compensation lands. The amount of money to be paid will be determined through an approved PAR or PAR-like analysis conducted for the compensation lands. The amount of required funding is initially estimated to be $1,450 for every acre of compensation lands. If compensation lands will not be identified and a PAR or PAR-like analysis completed within the time period specified for this payment (see the verification section at the end of this condition), the project owner shall provide initial payment of $1,450 an acre for the acres identified in the verified and approved delineation of habitat required by this condition, or if the delineation is not completed, shall provide $300,875 calculated

at $1,450 an acre for 207.5 acres into an account for long-term maintenance and management of compensation lands. The amount of the required initial payment or security for this item shall be adjusted for any change in the Project footprint as described above. If an initial payment is made based on the estimated per-acre costs, the project owner shall deposit additional money as may be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. If the approved analysis indicates less than $1,450 an acre will be required for long-term maintenance and management, the excess paid will be returned to the Project owner.

The project owner must obtain the CPM's approval of the entity that will receive and hold the long-term maintenance and management fund for the compensation lands. The CPM will consult with CDFG before deciding whether to approve an entity to hold the project's long-term maintenance and management funds. The CPM, in consultation with CDFG, may designate another non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity.

If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision.

The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

i. Interest. Interest generated from the initial capital shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action designed to protect or improve the habitat values of the compensation lands.

ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM, in consultation with CDFG, or the approved third-party long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this

provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFG designates NFWF or another entity to manage the long-term maintenance and management fee for CDFG.

iii. Pooling Funds. A CPM-approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the fund with other funds for the operation, management, and protection of the compensation lands for local populations of Mojave fringe-toed lizard. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CPM.

iv. Reimbursement Fund. The project owner shall provide reimbursement to CDFG or an approved third party for reasonable expenses incurred during title, easement, and documentation review; expenses incurred from other State or State-approved federal agency reviews; and overhead related to providing compensation lands.

COMPENSATORY MITIGATION LAND SECURITY

1. Compensation Mitigation Security: The project owner shall provide security sufficient for funding acquisition, improvement, and long-term management of Mojave fringe-toed lizard compensation land. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security.

   The security amount shall be based on the estimates provided in **Revised Biological Resources Tables 5** and **6.** This amount shall be updated and verified prior to payment and shall be adjusted to reflect actual costs or more current estimates as agreed upon by the REAT agencies.

   The Project owner shall provide verification that financial assurances have been established to the CPM with copies of the document(s) to BLM, CDFG and the USFWS, to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing activities described in Section A of this condition.

   In the event that the project owner defaults on the Security, the CPM may use money from the Security solely for implementation of

the requirements of this condition. The CPM's use of the security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition. Any amount of the Security that is not used to carry out mitigation shall be returned to the Project owner upon successful completion of the associated requirements in this condition.

Security for the requirements of this condition shall be provided in the amount of $660,416.25 (or $674,211.24 if the project owner elects to use the REAT Account with NFWF pursuant to paragraph 4 of this condition, below). The Security is calculated in part from the items that follow but adjusted as specified below (consult **Revised Biological Resources Tables 5** and **6** for the complete breakdown of estimated costs). However, regardless of the amount of the security or actual cost of implementation, the project owner shall be responsible for implementing all aspects of this condition.

i. land acquisition costs for compensation land, calculated at $1,000/acre;

ii. Site assessments, appraisals, biological surveys, transaction closing and escrow costs, calculated as $18,000 total per parcel (presuming 320 acres per parcel);

iii. Initial site clean-up, restoration, or enhancement, calculated at $250/acre;

iv. Third-party and agency administrative transaction costs and overhead, calculated as percentages of land cost;

v. Long-term management and maintenance fund, calculated at $1,450 per acre;

vi. NFWF fees to establish a project-specific account; manage the sub-account for acquisition and initial site work; and manage the sub-account for long term management and maintenance.

2. Phasing of Security Payment: Compensatory Mitigation Land Security may be phased according to phasing of the project's approval and construction. Phasing of compensation funding shall be based upon land disturbance and habit impacts for each project phase. Phasing of the mitigation payment is described further in staff's recommended **Condition of Certification BIO-31.**

3. The project owner may elect to comply with some or all of the requirements in this condition by providing funds to implement the requirements into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation

(NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs of implementing the requirement (as set forth in the Security section of this condition, paragraph 3, above). If the actual cost of the acquisition, initial protection and habitat improvements, long-term funding or other cost is more than the estimated amount initially paid by the project owner, the project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, the long-term funding requirements as established in an approved PAR or PAR-like analysis, or the other actual costs that are estimated in the table. If those actual costs or PAR projections are less than the amount initially transferred by the applicant, the remaining balance shall be returned to the project owner.

4. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the project.

5. The project owner may request the CPM to provide it with all available information about any funds held by the Energy Commission, CDFG, or NFWF as project security, or funds held in a NFWF sub-account for this project, or other project-specific account held by a third party. The CPM shall also fully cooperate with any independent audit that the project owner may choose to perform on any of these funds.

Verification: The project owner shall provide the CPM with written notice of intent to start ground disturbance at least 30 days prior to the start of ground-disturbing activities on the project site.

If the mitigation actions required under this condition are not completed at least 30 days prior to the start of ground-disturbing activities, the Project owner shall provide the CPM and CDFG with an approved Security in accordance with this condition of certification no later than 30 days prior to beginning Project ground-disturbing activities. Prior to submitting the Security to the CPM, the project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security. The project owner, or an approved third party, shall complete and provide written verification to the CPM, CDFG, BLM

and USFWS of the compensation lands acquisition and transfer within 18 months of the start of Project ground-disturbing activities.

No later than 12 months after the start of any phase of ground-disturbing project activities, the project owner shall submit a formal acquisition proposal to the CPM describing the parcels intended for purchase, and shall obtain approval from the CPM, in consultation with CDFG, BLM and USFWS, prior to the acquisition. If NFWF or another approved third party is handling the acquisition, the project owner shall fully cooperate with the third party to ensure the proposal is submitted within this time period. The project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the CPM, CDFG, BLM and USFWS of such completion, no later than 18 months after the issuance of the Energy Commission Decision. If NFWF or another approved third party is being used for the acquisition, the project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline,

The project owner shall complete and submit to the CPM a PAR or PAR-like analysis no later than 60 days after the CPM approves compensation lands for acquisition associated with any phase of construction. The project owner shall fully fund the required amount for long-term maintenance and management of the compensation lands for that phase of construction no later than 30 days after the CPM approves a PAR or PAR-like analysis of the anticipated long-term maintenance and management costs of the compensation lands. Written verification shall be provided to the CPM and CDFG to confirm payment of the long-term maintenance and management funds.

No later than 60 days after the CPM determines what activities are required to provide for initial protection and habitat improvement on the compensation lands for any phase of construction, the project owner shall make funding available for those activities and provide written verification to the CPM of what funds are available and how costs will be paid. Initial protection and habitat improvement activities on the compensation lands for that phase of construction shall be completed, and written verification provided to the CPM, no later than six months after the CPM's determination of what activities are required on the compensation lands.

The project owner, or an approved third party, shall provide the CPM, CDFG, BLM and USFWS with a management plan for the compensation lands associated with any phase of construction within180 days of the land or easement purchase, as determined by the date on the title. The CPM, in consultation with CDFG, BLM and the USFWS, shall approve the management plan after its content is acceptable to the CPM.

Within 90 days after completion of all project related ground disturbance, the project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction. This shall be the basis for the final number of acres required to be acquired.

GILA MONSTER MITIGATION

BIO-14 Concurrent with Desert Tortoise Clearance surveys (**BIO-15,** below), the project owner shall conduct pre-construction surveys for Gila monsters. If a Gila monster is encountered during clearance surveys or during construction, a qualified biologist experienced with Gila monster survey and capture techniques shall capture and maintain it in a cool (85 degrees F) environment until it can be released to a safe, suitable area beyond the construction impact zone. The biologist shall coordinate with staff and CDFG biologists in the transport and relocation of any Gila monsters encountered during project surveys, construction, or operation. A written report documenting any Gila monsters relocated shall be provided to the CPM within 30 days of relocation.

Verification: Within 30 days after completion of clearance surveys the Designated Biologist shall submit a report to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG describing implementation and results, including description of any relocation of Gila monsters. The report shall include the number of Gila monsters moved; their state of health, including wounds or visible signs of illness; and the location of relocation.

DESERT TORTOISE CLEARANCE SURVEYS AND EXCLUSION FENCING

BIO-15 The project owner shall undertake appropriate measures to manage the construction site and related facilities in a manner to avoid or minimize impacts to desert tortoise. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling and other procedures shall be consistent with those described in the USFWS' 2009 *Desert Tortoise Field Manual* http://www.fws.gov/ventura/speciesinfo/protocols_guidelines or more current guidance provided by CDFG and USFWS. The project owner shall also implement all terms and conditions described in the Biological Opinion for the Project prepared by USFWS. These measures include, but are not limited to, the following:

1. Desert Tortoise Exclusion Fence Installation. To avoid impacts to desert tortoises, permanent desert tortoise exclusion fencing shall be installed along the permanent perimeter security fence and temporarily installed along the utility corridors at tower locations, laydown areas, or other staging areas. Tortoise exclusion fencing shall also be installed as necessary to prevent tortoises on the

southern NAP (not a part) area (between the project site and Interstate-40) to prevent tortoises from entering the highway. If the culvert areas cannot be fenced due to restrictions associated with highway maintenance, the two tortoises would be translocated off the site (see **BIO-16).** The proposed alignments for the permanent perimeter fence and utility rights-of-way fencing shall be flagged and surveyed within 24 hours prior to the initiation of fence construction. Clearance surveys of the perimeter fence and utility rights-ofway alignments shall be conducted by the Designated Biologist(s) using techniques approved by the USFWS and CDFG and may be conducted in any season with USFWS and CDFG approval. Biological Monitors may assist the Designated Biologist under his or her supervision with the approval of the CPM, BLM, USFWS, and CDFG. These fence clearance surveys shall provide 100-percent coverage of all areas to be disturbed and an additional transect along both sides of the fence line. This fence line transect shall cover an area approximately 90 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.* Any desert tortoise located during fence clearance surveys shall be handled by the Designated Biologist(s) in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.*

a. Timing, Supervision of Fence Installation. The exclusion fencing shall be installed prior to the onset of site clearing and grubbing. Fencing shall also be placed along both sides of any construction access roads within tortoise habitat but outside the fenced construction area, and maintained throughout the construction phase of the project, unless otherwise approved by the CPM, BLM Wildlife Biologist, USFWS, and CDFG. The fence installation shall be supervised by the Designated Biologist and monitored by the Biological Monitors to ensure the safety of any tortoise present.

b. Fence Material and Installation. The permanent tortoise exclusionary fencing shall be constructed in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (Chapter 8 – Desert Tortoise Exclusion Fence).

c. Security Gates. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time. Cattle grating designed

to safely exclude desert tortoise shall be installed at the gated entries to discourage tortoises from gaining entry.

d. Fence Inspections. Following installation of the desert tortoise exclusion fencing for both the permanent site fencing and temporary fencing in the utility corridors, the fencing shall be regularly inspected. If tortoise were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times a day for the first 7 days to ensure a recently moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly and during and within 24 hours following all major rainfall events. A major rainfall event is defined as one for which surface flow is detectable within the fenced drainage during the storm, or for which channels on-site show any evidence of newly deposited sediments, bank erosion, or channel reworking following the storm. The project owner shall be responsible for monitoring storm flows and changes to channels to evaluate need for fence inspection. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 48 hours of observing damage. Inspections of permanent site fencing shall occur for the life of the project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise.

e. Derailment or other emergency. In the case of derailment or other emergency, project owner is required to provide BNSF access to the Project site for emergency response. This access may include, among other activities, temporary removal of portions of the desert tortoise exclusionary fencing, the immediate placement of a temporary fence and the placement of the applicable portion of the permanent fence within 48 hours of the temporary removal of such portion.

2. Desert Tortoise Clearance Surveys within the Plant Site. Following construction of the permanent perimeter security fence and the attached tortoise exclusion fence, the permanently fenced power plant site shall be cleared of tortoises by the Designated Biologist, who may be assisted by the Biological Monitors. Clearance surveys shall be conducted in accordance with the USFWS' 2009 *Desert Tortoise Field Manual* (Chapter 6 – Clearance Survey Protocol for the Desert Tortoise – Mojave Population) and shall consist of two surveys covering 100% the project area by walking transects no

more than 15-feet apart. If a desert tortoise is located on the second survey, a third survey shall be conducted. Each separate survey shall be walked in a different direction to allow opposing angles of observation. Clearance surveys of the power plant site may only be conducted when tortoises are most active (April through May or September through October). Surveys outside of these time periods require approval by USFWS and CDFG. Any tortoise located during clearance surveys of the power plant site shall be relocated and monitored in accordance with the Desert Tortoise Translocation Plan (Condition of Certification **BIO-1 6**).

a. Burrow Searches. During clearance surveys all desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, shall be examined by the Designated Biologist, who may be assisted by the Biological Monitors, to assess occupancy of each burrow by desert tortoises and handled in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.* To prevent reentry by a tortoise or other wildlife, all burrows shall be collapsed once absence has been determined. Tortoises taken from burrows and from elsewhere on the power plant site shall be translocated as described in the Desert Tortoise Translocation Plan.

b. Burrow Excavation/Handling. All potential desert tortoise burrows located during clearance surveys would be excavated by hand, tortoises removed, and collapsed or blocked to prevent occupation by desert tortoises. All desert tortoise handling and removal, and burrow excavations, including nests, would be conducted by the Designated Biologist, who may be assisted by a Biological Monitor in accordance with the USFWS' 2009 *Desert Tortoise Field Manual.*

3. Monitoring Following Clearing. Following the desert tortoise clearance and removal from the power plant site and utility corridors and initial memo or verbal completion report to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG (below), workers and heavy equipment shall be allowed to enter the project site to perform clearing, grubbing, leveling, and trenching. A Designated Biologist shall monitor clearing and grading activities to find and move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be translocated as described in the Desert Tortoise Translocation Plan to an area approved by the Designated Biologist.

4. Reporting. The Designated Biologist shall record the following information for any desert tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition

and health, including injuries, state of healing and whether desert tortoise voided their bladders; c) location moved from and location moved to (using GPS technology); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled desert tortoise as described in the paragraph below. Desert tortoise moved from within project areas shall be marked and monitored in accordance with the Desert Tortoise Translocation Plan.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist. Immediately upon completion of clearance surveys and desert tortoise removal from the site, the Designated Biologist shall provide an initial memo or verbal report of the results to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG. Within 30 days after completion of desert tortoise clearance surveys the Designated Biologist shall submit a report to BLM's Wildlife Biologist, the CPM, USFWS, and CDFG describing implementation of each of the mitigation measures listed above and compliance with Gila monster clearance survey (**BIO-14).** The report shall include the desert tortoise survey results, capture and release locations of any relocated desert tortoises, and any other information needed to demonstrate compliance with the measures described above.

DESERT TORTOISE TRANSLOCATION PLAN

BIO-16 The project owner shall develop and implement a final Desert Tortoise Translocation Plan (Plan) in conformance with standards and guidelines described in *Translocation of Desert Tortoises (Mojave Population) From Project Sites: Plan Development Guidance* (USFWS 2010), any more current guidance or recommendations as available from CDFG or USFWS, and meets the approval of USFWS, CDFG, BLM's Wildlife Biologist and the CPM. The goal of the Plan shall be to safely exclude desert tortoises from within the fenced project area and translocate them to suitable habitat capable of supporting them, while minimizing stress and potential for disease transmission. Tortoises to be moved farther than 500 meters shall be tested for disease prior to translocation. The Plan shall include written correspondence with CalTrans indicating whether tortoise exclusion fencing may be installed to prevent tortoises on the southern NAP area (between the project site and Interstate-40) to prevent tortoises from entering the highway. If CalTrans does not permit that fencing, then desert tortoises shall be translocated off the NAP site (see **BIO-15).** The final Plan shall be based on the draft Desert Tortoise Translocation Plan prepared by the applicant and shall include all revisions deemed necessary by USFWS, CDFG, BLM'S Wildlife Biologist, and staff. The Plan shall include but not be limited to, a list of the authorized handlers, protocols for disease

testing and assessing tortoise health, proposed translocation locations and procedures, schedule of translocations, a habitat assessment of translocation lands, monitoring and reporting, and contingency planning (e.g., handling an injured or diseased tortoise).

Verification: Within 30 days of publication of the Energy Commission License Decision or BLM's Record of Decision/ROW Issuance, whichever comes first, the project owner shall provide BLM's Wildlife Biologist and the CPM with the final version of a Desert Tortoise Translocation Plan that has been reviewed and approved by BLM's Wildlife Biologist and the CPM in consultation with USFWS and CDFG. The plan shall include the locations of the translocation sites. The project owner may not translocate more than 98 tortoises unless the project owner first provides the CPM with documentation demonstrating that adequate translocation sites have been identified, and obtains CPM approval of those translocation sites. All modifications to the approved Plan shall be made only after approval by BLM's Wildlife Biologist and the CPM, in consultation with USFWS and CDFG. Within 30 days after initiation of translocation activities, the Designated Biologist shall provide to BLM's Wildlife Biologist and the CPM for review and approval, a written report identifying which items of the Plan have been completed, and a summary of all modifications to measures made during implementation of the Plan. Written monthly progress reports shall be provided to the BLM's Wildlife Biologist and CPM for the duration of the Plan implementation, including the duration of monitoring of translocated tortoises.

DESERT TORTOISE COMPENSATORY MITIGATION

DESERT TORTOISE COMPENSATORY MITIGATION

BIO-17 The project owner shall provide compensatory mitigation acreage of 10,302 acres of desert tortoise habitat lands, adjusted to reflect the final project footprint, as specified in this condition. In addition, the project owner shall provide funding for initial improvement and long-term maintenance, enhancement, and management of the acquired lands for protection and enhancement of desert tortoise populations, and comply with other related requirements of this condition. This acreage was calculated as follows: a ratio of 1:1 for the project area south of the BNSF railroad tracks (2,140 acres); a ratio of 3:1 ratio for 2,104 acres of the project area north of the BNSF railroad tracks; and a ratio of 5:1 for 370 additional acres north of the BNSF railroad tracks. See **Table**, below.

Desert Tortoise Compensation Acreage Summary:

Location	Project Impact Acreage	Mitigation Ratio	Compensation Acreage
South of BNSF RR	2,140 acres	1:1	2,140 acres
North of BNSF RR (southern Phase 1b acreage)	2.104 acres	3:1	6,312 acres

North of BNSF RR (northern Phase 2 area, Scenario 5.5 only)	370 acres	5:1	1,850 acres
Scenario 5.5 Total	**4,614 acres**		**10,302 acres**

Costs of these requirements are estimated to be $31,079,934.00 for Scenario 5.5 (see Ex. 317, **Biological Resources Addendum Tables 5** and **7** for a complete breakdown of costs and acreage).

As many as 4,614 acres of the compensation lands requirement may be satisfied by applicant's compliance with the desert tortoise habitat acquisition or enhancement requirements of BLM, to be calculated as an acre-for-acre offset in the Energy Commission requirement for mitigation provided to satisfy BLM's requirements. For purposes of this paragraph, credit will be given for BLM-required mitigation without regard to whether BLM uses the mitigation funds for habitat acquisition or for enhancement projects to benefit the species.

These impact acreages shall be adjusted to reflect the final project footprint. For purposes of this condition, the Project footprint means all lands disturbed in the construction and operation of the Calico Solar Project, including all linear project components, as well as all undeveloped areas inside the Project's boundaries.

The project owner shall provide financial assurances as described below in the amount of $31,079,934.00. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into a Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as described below. If the Project owner elects to establish a REAT NFWF Account and have NFWF and the agencies complete the required habitat compensation, then the total estimated cost of complying with this condition is $31,755,574.02. The amount of security or NFWF deposit shall be adjusted up or down to reflect any revised cost estimates recommended by REAT.

The actual costs to comply with this condition will vary depending on the final footprint of the Project, the costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a Property Analysis Report or similar analysis (below). The 4,614 acre habitat requirement, and associated funding requirements based on that acreage, shall be adjusted up or down if there are changes in the final footprint of the project or the associated costs of evaluation, acquisition, management, and other factors listed in **Biological Resources Addendum Tables 5**

and **7**. Regardless of actual cost, the project owner shall be responsible for funding all requirements of this condition.

COMPENSATORY MITIGATION LAND ACQUISITION

1. Method of Acquisition. Compensation lands shall be acquired by either of the two options listed below. Regardless of the method of acquisition, the transaction shall be complete only upon completion of all terms and conditions described in this Condition of Certification.

a. The project owner shall acquire lands and transfer title and/or conservation easement to a state or federal land management agency or to a third-party non-profit land management organization, as approved by the CPM in consultation with BLM, CDFG, and USFWS; or

b. The Project owner shall deposit funds into a project-specific subaccount within the REAT Account established with the NFWF, in the amount as indicated in **Biological Resources Addendum Tables 5** and **7** (adjusted to reflect final project footprint and any applicable REAT adjustments to costs).

2. Selection Criteria for Compensation Lands. The compensation lands selected for acquisition to meet Energy Commission and CESA requirements shall be equal to or better than the quality and function of the habitat impacted and:

a. be within the Western Mojave Recovery Unit, with potential to contribute to desert tortoise habitat connectivity and build linkages between desert tortoise designated critical habitat, known populations of desert tortoise, and/or other preserve lands;

b. provide habitat for desert tortoise with capacity to regenerate naturally when disturbances are removed;

c. be near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a non-governmental organization dedicated to habitat preservation;

d. be contiguous and biologically connected to lands currently occupied by desert tortoise, ideally with populations that are stable, recovering, or likely to recover;

e. not have a history of intensive recreational use or other disturbance that might cause future erosional damage or other habitat damage, and make habitat recovery and restoration infeasible;

f. not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration; and

g. not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and

h. have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with CDFG, BLM and USFWS, agrees in writing to the acceptability of land without these rights.

3. Review and Approval of Compensation Lands Prior to Acquisition. The project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for desert tortoise in relation to the criteria listed above and must be approved by the CPM. The CPM will share the proposal with and consult with CDFG, BLM and the USFWS before deciding whether to approve or disapprove the proposed acquisition.

4. Compensation Lands Acquisition Conditions: The project owner shall comply with the following conditions relating to acquisition of the compensation lands after the CPM, in consultation with CDFG, BLM and the USFWS have approved the proposed compensation lands:

a. Preliminary Report: The Project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM, in consultation with CDFG, BLM and the USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.

b. Title/Conveyance: The Project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the CPM in consultation with CDFG. Any transfer of a conservation easement or fee title must be to CDFG, a non-profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code section 65965), or to BLM or other public agency approved by the CPM in consultation with CDFG. If an approved non-profit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFG or another entity approved by the CPM. If an

approved non-profit holds a conservation easement, CDFG shall be named a third party beneficiary. If an entity other than CDFG holds a conservation easement over the compensation lands, the CPM may require that CDFG or another entity approved by the CPM, in consultation with CDFG, be named a third party beneficiary of the conservation easement. The Project owner shall obtain approval of the CPM, in consultation with CDFG, of the terms of any transfer of fee title or conservation easement to the compensation lands.

c. Property Analysis Record. Upon identification of the compensation lands, the Project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management fund to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM, in consultation with CDFG, before it can be used to establish funding levels or management activities for the compensation lands.

5. Compensation Lands Acquisition Costs: The Project owner shall pay all other costs related to acquisition of compensation lands and conservation easements. In addition to actual land costs, these acquisition costs shall include but shall not be limited to the items listed below. Management costs including site cleanup measures are described separately, in the following section.

a. Level 1 Environmental Site Assessment;

b. Appraisal;

c. Title and document review costs;

d. Expenses incurred from other state, federal, or local agency reviews;

e. Closing and escrow costs;

f. Overhead costs related to providing compensation lands to CDFG or an approved third party;

g. Biological survey(s) to determine mitigation value of the land; and

h. Agency costs to accept the land (e.g., writing and recording of conservation easements; title transfer).

COMPENSATORY MITIGATION LAND IMPROVEMENT

1. Land Improvement Requirements: The Project owner shall fund activities that the CPM, in consultation with the CDFG, USFWS and BLM, requires for the initial protection and habitat improvement of

the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include surveys of boundaries and property lines, installation of signs, trash removal and other site cleanup measures, construction and repair of fences, invasive plant removal, removal of roads, and similar measures to protect habitat and improve habitat quality on the compensation lands.

The costs of these activities are estimated at $250 an acre, but will vary depending on the measures that are required for the compensation lands. A non-profit organization, CDFG or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code section 65965), if it meets the approval of the CPM in consultation with CDFG, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFG takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFG or its designee.

COMPENSATORY MITIGATION LAND LONG-TERM MANAGEMENT

1. Long-term Management Requirements: Long-term management is required to ensure that the compensation lands are managed and maintained to protect and enhance habitat for desert tortoise. Management activities may include maintenance of signs, fences, removal of invasive weeds, monitoring, security and enforcement, and control or elimination of unauthorized use.

2. Long-term Management Plan. The project owner shall pay for the preparation of a Management Plan for the compensation lands. The Management Plan shall reflect site-specific enhancement measures on the acquired compensation lands. The plan shall be submitted for approval of the CPM, in consultation with CDFG, BLM and USFWS.

3. Long-Term Maintenance and Management Funding. The Project owner shall provide money to establish an account with a non-wasting capital that will be used to fund the long-term maintenance and management of the compensation lands. The amount of money to be paid will be determined through an approved PAR or PAR-like analysis conducted for the compensation lands. The amount of required funding is initially estimated to be $1,450 for every acre of compensation lands. If compensation lands will not be identified and a PAR or PAR-like analysis completed within the time period specified for this payment (see the verification section at the end of this condition), the Project owner shall provide initial

payment of $14,937,900.00 calculated at $1,450 an acre for each compensation acre, as shown in **Biological Resources Addendum Tables 5 and 7** (above into an account for long-term maintenance and management of compensation lands. The amount of the required initial payment or security for this item shall be adjusted for any change in the Project footprint as described above. If an initial payment is made based on the estimated per-acre costs, the project owner shall deposit additional money as may be needed to provide the full amount of long-term maintenance and management funding indicated by a PAR or PAR-like analysis, once the analysis is completed and approved. If the approved analysis indicates less than $1,450 an acre will be required for long-term maintenance and management, the excess paid will be returned to the Project owner.

The project owner must obtain the CPM's approval of the entity that will receive and hold the long-term maintenance and management fund for the compensation lands. The CPM will consult with the project owner and CDFG before deciding whether to approve an entity to hold the project's long-term maintenance and management funds on any lands. The CPM, in consultation with the project owner and CDFG, may designate another state agency or non-profit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity.

If CDFG takes fee title to the compensation lands, CDFG shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFG and with CDFG supervision.

The Project owner shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:

i. Interest. Interest generated from the initial capital shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action approved by CDFG designed to protect or improve the habitat values of the compensation lands.

ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM, in consultation with CDFG, or the approved third-party long-term maintenance and

management fee manager to ensure the continued viability of the species on the compensation lands. If CDFG takes fee title to the compensation lands, monies received by CDFG pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFG designates NFWF or another entity to manage the long-term maintenance and management fee for CDFG.

iii. Pooling Funds. A CPM- approved non-profit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the fund with other funds for the operation, management, and protection of the compensation lands for local populations of desert tortoise. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CDFG and CPM.

iv. Reimbursement Fund. The project owner shall provide reimbursement to CDFG or an approved third party for reasonable expenses incurred during title, easement, and documentation review; expenses incurred from other State or State-approved federal agency reviews; and overhead related to providing compensation lands.

COMPENSATORY MITIGATION LAND SECURITY

1. Compensation Mitigation Security: The project owner shall provide security sufficient for funding acquisition, improvement, and long-term management of desert tortoise compensation land. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the CPM, the Project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security.

   The security amount shall be based on the estimates provided in **Biological Resources Addendum Tables 5** and **7.** This amount shall be updated and verified prior to payment and shall be adjusted to reflect actual costs or more current estimates as agreed upon by the REAT agencies.

   The Project owner shall provide verification that financial assurances have been established to the CPM with copies of the document(s) to BLM, CDFG and the USFWS, to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing activities described in Section A of this condition.

In the event that the project owner defaults on the Security, the CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the security to implement measures in this condition may not fully satisfy the Project owner's obligations under this condition. Any amount of the Security that is not used to carry out mitigation shall be returned to the Project owner upon successful completion of the associated requirements in this condition.

Security for the requirements of this condition shall be provided in the amount of $31,079,934 (or $31,755,574.02 if the project owner elects to use the REAT Account with NFWF pursuant to paragraph 4 of this condition, below). The Security is calculated in part from the items that follow but adjusted as specified below (consult **Biological Resources Addendum Tables 5** and **7** for the complete breakdown of estimated costs). However, regardless of the amount of the security or actual cost of implementation, the project owner shall be responsible for implementing all aspects of this condition.

i. land acquisition costs for compensation land, calculated at $1,000/acre;

ii. Site assessments, appraisals, biological surveys, transaction closing and escrow costs, calculated as $18,000 total per parcel (presuming 320 acres per parcel)

iii. Initial site clean-up, restoration, or enhancement, calculated at $250/acre;

iv. Third-party and agency administrative transaction costs and overhead, calculated as percentages of land cost;

v. Long-term management and maintenance fund, calculated at $1,450 per acre;

vi. NFWF fees to establish a project-specific account; manage the sub-account for acquisition and initial site work; and manage the sub-account for long term management and maintenance.

2. Phasing of Security Payment: Compensatory Mitigation Land Security may be phased according to phasing of the project's approval and construction. Phasing of compensation funding shall be based upon land disturbance and habit impacts for each project phase. Phasing of the mitigation payment is described further in staff's recommended **Condition of Certification BIO-31** (most recent revision, below).

3. The project owner may elect to comply with some or all of the requirements in this condition by providing funds to implement the requirements into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs of implementing the requirement (as set forth in the Security section of this condition, paragraph 3, above). If the actual cost of the acquisition, initial protection and habitat improvements, long-term funding or other cost is more than the estimated amount initially paid by the project owner, the project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, the long-term funding requirements as established in an approved PAR or PAR-like analysis, or the other actual costs that are estimated in the table. If those actual costs or PAR projections are less than the amount initially transferred by the applicant, the remaining balance shall be returned to the project owner.

4. The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the project.

5. The project owner may request the CPM to provide it with all available information about any funds held by the Energy Commission, CDFG, or NFWF as project security, or funds held in a NFWF sub-account for this project, or other project-specific account held by a third party. The CPM shall also fully cooperate with any independent audit that the project owner may choose to perform on any of these funds.

Verification: The project owner shall provide the CPM with written notice of intent to start ground disturbance at least 30 days prior to the start of ground-disturbing activities on the project site.

If the mitigation actions required under this condition are not completed at least 30 days prior to the start of ground-disturbing activities, the Project owner shall provide verification to the CPM and CDFG that an approved Security has been established in accordance with this condition of certification no later than 30 days

prior to beginning Project ground-disturbing activities. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security"). Prior to submitting the Security to the CPM, the project owner shall obtain the CPM's approval, in consultation with CDFG, BLM and the USFWS, of the form of the Security. The project owner, or an approved third party, shall complete and provide written verification to the CPM, CDFG, BLM and USFWS of the compensation lands acquisition and transfer within 18 months of the start of Project ground-disturbing activities.

No later than 12 months after the start of any phase of ground-disturbing project activities, the project owner shall submit a formal acquisition proposal to the CPM describing the parcels intended for purchase, and shall obtain approval from the CPM, in consultation with CDFG, BLM and USFWS, prior to the acquisition. If NFWF or another approved third party is handling the acquisition, the project owner shall fully cooperate with the third party to ensure the proposal is submitted within this time period. The project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the CPM, CDFG, BLM and USFWS of such completion, no later than 18 months after the issuance of the Energy Commission Decision. If NFWF or another approved third party is being used for all or part of the acquisition, the project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline.

The project owner shall complete and submit to the CPM a PAR or PAR-like analysis no later than 60 days after the CPM approves compensation lands for acquisition associated with any phase of construction. The project owner shall fully fund the required amount for long-term maintenance and management of the compensation lands for that phase of construction no later than 30 days after the CPM approves a PAR or PAR-like analysis of the anticipated long-term maintenance and management costs of the compensation lands. Written verification shall be provided to the CPM and CDFG to confirm payment of the long-term maintenance and management funds.

No later than 60 days after the CPM determines what activities are required to provide for initial protection and habitat improvement on the compensation lands for any phase of construction, the project owner shall make funding available for those activities and provide written verification to the CPM of what funds are available and how costs will be paid. Initial protection and habitat improvement activities on the compensation lands for that phase of construction shall be completed, and written verification provided to the CPM, no later than six months after the CPM's determination of what activities are required on the compensation lands.

The project owner, or an approved third party, shall provide the CPM, CDFG, BLM and USFWS with a management plan for the compensation lands associated with any phase of construction within180 days of the land or easement purchase, as determined by the date on the title. The CPM, in consultation with CDFG, BLM and the USFWS, shall approve the management plan after its content is acceptable to the CPM.

Within 90 days after completion of all project related ground disturbance, the project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction. If this analysis shows that more lands were disturbed than was anticipated in this condition, the project owner shall provide the Energy Commission with additional compensation lands and funding commensurate with the added impacts and applicable mitigation ratios set forth in this condition. A final analysis of all project related ground disturbance may not result in a reduction of compensation requirements if the deadlines established under this condition for transfer of compensation lands and funding have passed prior to completion of the analysis.

RAVEN MONITORING, MANAGEMENT, AND CONTROL PLAN

BIO-18 The project owner shall design and implement a Raven Monitoring, Management, and Control Plan (Raven Plan) that is consistent with the most current USFWS-approved raven management guidelines and that meets the approval of the USFWS, CDFG, and the CPM. Any subsequent modifications to the approved Raven Plan shall be made only with approval of the CPM in consultation with USFWS and CDFG. The Raven Plan shall include but not be limited to a program to monitor increased raven presence in the Project vicinity and to implement raven control measures as needed based on that monitoring. The purpose of the plan is to avoid any Project-related increases in raven numbers during construction, operation, and decommissioning. The threshold for implementation of raven control measures shall be any increases in raven numbers from baseline conditions, as detected by monitoring to be proposed in the Raven Plan. Regardless of raven monitoring results, the project owner shall be responsible for all other aspects of the Raven Plan, including avoidance and minimization of project-related trash, water sources, or perch/roost sites that could contribute to increased raven numbers. In addition, to offset the cumulative contributions of the Project to desert tortoise from increased raven numbers, the Project owner shall also contribute to the USFWS Regional Raven Management Program. The Project owner shall do all of the following:

1. <u>Prepare and Implement a Raven Management Plan</u> that includes the following:

a. Identify conditions associated with the Project that might provide raven subsidies or attractants;

b. Describe management practices to avoid or minimize conditions that might increase raven numbers and predatory activities;

c. Describe control practices for ravens;

d. Address monitoring and nest removal during construction and for the life of the Project, and;

e. Discuss reporting requirements.

2. Contribute to the USFWS Regional Raven Management Program. The project owner shall submit payment to the project sub-account of the REAT Account held by the National Fish and Wildlife Foundation (NFWF) to support the USFWS Regional Raven Management Program. The amount shall be a one-time payment of $105 per acre of permanent disturbance and a 2% fund management fee (totaling $494,159.40). Payment may be made in phases corresponding to proposed phasing of the project described in Condition of Certification **BIO-31.**

Verification: No later than 30 days prior to the start of construction, the project owner shall provide written verification to the CPM that NFWF has received and accepted payment into the project's sub-account of the REAT Account to support the USFWS Regional Raven Management Program.

No later than 30 days prior to any construction-related ground disturbance activities, the Project owner shall provide the CPM, USFWS, and CDFG with the final version of a Raven Plan. All modifications to the approved Raven Plan shall be made only with approval of the CPM in consultation with USFWS and CDFG.

Within 30 days after completion of Project construction, the Project owner shall provide to the CPM for review and approval, a written report identifying which items of the Raven Plan have been completed, a summary of all modifications to mitigation measures made during the Project's construction phase, and which items are still outstanding.

On January 31st of each year following construction the Designated Biologist shall provide a report to the CPM that includes: a summary of the results of raven management and control activities for the year; a discussion of whether raven control and management goals for the year were met; and recommendations for raven management activities for the upcoming year.

PRE-CONSTRUCTION NEST SURVEYS AND IMPACT AVOIDANCE MEASURES FOR MIGRATORY BIRDS

BIO-19 Pre-construction nest surveys shall be conducted each year during the construction phase of the project if construction activities will occur during the breeding period (from January 1 through August 1). The Designated Biologist or Biological Monitor conducting the surveys shall be experienced bird surveyors who have demonstrated experience conducting nest searches; are knowledgeable of the nesting habitats of species that may nest on the site; and are familiar with standard nest-locating techniques such as those described in Martin and Guepel (1993). Surveys shall be conducted in accordance with the following guidelines. Nothing in this condition requires the project owner to conduct burrowing owl surveys by entering private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission. In this situation only, the project owner may substitute binocular surveys for protocol field surveys.

1. Surveys shall cover all potential nesting habitat in the project site and within 500 feet of the boundaries of the plant site and linear facilities;

2. At least two pre-construction 100-percent coverage surveys shall be conducted of each proposes construction area, separated by a minimum 10-day interval. One of the surveys shall be conducted within the 10 days preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed one week in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation;

3. If active nests are detected during the survey, a 500 foot no-disturbance buffer zone shall be implemented and a monitoring plan shall be developed. This protected area surrounding the nest may be adjusted by the Designated Biologist in consultation with CDFG, BLM, USFWS, and CPM. Nest locations shall be mapped using GPS technology and the location data provided in completion reports (below) to the CPM and BLM Wildlife Biologist; and

4. The Designated Biologist shall monitor the nest until he or she determines that nestlings have fledged and dispersed. Monitoring shall avoid disturbing the nests or causing an increased risk of predation. Activities that might, in the opinion of the Designated Biologist and in consultation with the CPM and BLM, disturb nesting activities shall be prohibited within the buffer zone until such a determination is made.

Verification: Upon completion of the surveys, and prior to initiating any vegetation removal or ground-disturbing activities (i.e., no more than 10 days prior to the start of such activities), the project owner shall provide the CPM and BLM a letter-report describing the methods and findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest.

PRE-CONSTRUCTION SURVEYS FOR GOLDEN EAGLES

BIO-20 The Project owner shall implement the following measures to avoid or minimize Project-related construction impacts to golden eagles.

1. Annual Inventory During Construction. For each calendar year during which construction will occur an inventory shall be conducted to determine if golden eagle territories occur within one mile of the Project boundaries. Survey methods and surveyor qualifications for the inventory shall be as described in the Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations (Pagel et al. 2010) or more current guidance from the USFWS.

2. Inventory Data: Data collected during the inventory shall include at least the following: territory status (unknown, vacant, occupied, breeding successful, breeding unsuccessful); nest location, nest elevation; age class of golden eagles observed; nesting chronology; number of young at each visit; digital photographs; and substrate upon which nest is placed.

3. Determination of Unoccupied Territory Status: A nesting territory or inventoried habitat shall be considered unoccupied by golden eagles only after completing at least two full surveys in a single breeding season.

4. Monitoring and Adaptive Management Plan: If an occupied nest[2] is detected within one mile of the Project boundaries, the Project owner shall prepare and implement a Golden Eagle Monitoring and Management Plan for the duration of construction to ensure that Project construction activities do not result in injury or disturbance to golden eagles. The monitoring methods shall be consistent with those described in the Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations (Pagel et al. 2010) or more current guidance from the USFWS. The Monitoring and Management Plan shall be prepared in consultation with the USFWS. Triggers for adaptive management shall include any

evidence of Project-related disturbance to nesting golden eagles, including but not limited to: agitation behavior (displacement, avoidance, and defense); increased vigilance behavior at nest sites; changes in foraging and feeding behavior, or nest site abandonment. The monitoring and Management Plan shall include a description of adaptive management actions, which shall include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of golden eagle disturbance.

Verification: No later than 30 days after completion of the golden eagle inventory the project owner shall submit a report to the CPM, CDFG, and USFWS documenting the results of the inventory.

If an occupied nest is detected within one mile of the Project boundary during the inventory, the Project owner shall contact staff at the USFWS Ventura Office and CDFG within one working day of detection of the nest for interim guidance on monitoring and nest protection. The project owner shall provide the CPM, CDFG, and USFWS with the final version of the Golden Eagle Monitoring and Management Plan within 30 days after detection of the nest. This final Plan shall have been reviewed and approved by the CPM in consultation with USFWS and CDFG.

BURROWING OWL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-21 The Project owner shall implement the following measures to avoid, minimize and offset impacts to burrowing owls. Nothing in this condition requires the project owner to conduct burrowing owl surveys by entering private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission. In this situation only, the project owner may substitute binocular surveys for protocol field surveys.

1. Pre-Construction Surveys. The Designated Biologist or Biological Monitor shall conduct pre-construction surveys for burrowing owls no more than 30 days prior to initiation of construction activities. Surveys shall be focused exclusively on detecting burrowing owls, and shall be conducted from two hours before sunset to one hour after or from one hour before to two hours after sunrise. The survey area shall include the Project Disturbance Area and surrounding 500 foot survey buffer.

2. Implement Avoidance Measures. If an active burrowing owl burrow is detected within 500 feet from the Project Disturbance Area the following avoidance and minimization measures shall be implemented:

a. Establish Non-Disturbance Buffer. Fencing shall be installed at a 250-foot radius from the occupied burrow to create a non-disturbance buffer around the burrow. The non-disturbance buffer and fence line may be reduced to 160 feet if all Project-related activities that might disturb burrowing owls would be conducted during the non-breeding season (September 1st through January 31st). Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.

b. Monitoring: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 – August 31st) the Designated Biologist or Biological Monitor shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall implement measures to minimize or avoid such disturbance.

3. Passive Relocation of Burrowing Owls. If pre-construction surveys indicate the presence of burrowing owls within the Project Disturbance Area (the Project Disturbance Area means all lands disturbed in the construction and operation of the Genesis Project), the Project owner shall prepare and implement a Burrowing Owl Relocation and Mitigation Plan, in addition to the avoidance measures described above. The final Burrowing Owl Relocation and Mitigation Plan shall be approved by the CPM, in consultation with USFWS, BLM and CDFG, and shall:

a. Identify and describe suitable relocation sites within 1 mile of the Project Disturbance Area, and describe measures to ensure that burrow installation or improvements would not affect sensitive species habitat or existing burrowing owl colonies in the relocation area;

b. Provide guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl, including a discussion of timing of burrow improvements, specific location of burrow installation, and burrow design. Design of the artificial burrows shall be consistent with CDFG guidelines (CDFG 1995) and shall be approved by the CPM in consultation with CDFG, BLM and USFWS;

c. Passive relocation sites shall be in areas of suitable habitat for burrowing owl nesting, and be characterized by minimal human disturbance and access. Relative cover of non-native plants within the proposed relocation sites shall not exceed the relative cover of non-native plants in the adjacent habitats;

d. Provide detailed methods and guidance for passive relocation of burrowing owls occurring within the Project Disturbance Area; and

4. Acquire Compensatory Mitigation Lands for Burrowing Owls. The following measures for compensatory mitigation shall apply only if burrowing owls that are detected within the Project Disturbance Area. The Project owner shall acquire, in fee or in easement, 19.5 acres of land for each burrowing owl that is displaced by construction of the Project. This compensation acreage of 19.5 acres per single bird or pair of nesting owls assumes that there is no evidence that the compensation lands are occupied by burrowing owls. If burrowing owls are observed to occupy the compensation lands, then only 9.75 acres per single bird or pair is required, per CDFG (1995) guidelines. If the compensation lands are contiguous to currently occupied habitat, then the replacement ratio will be 13.0 acres per pair or single bird. The Project owner shall provide funding for the enhancement and long-term management of these compensation lands. The acquisition and management of the compensation lands may be delegated by written agreement to CDFG or to a third party, such as a non-governmental organization dedicated to habitat conservation, subject to approval by the CPM, in consultation with CDFG and USFWS prior to land acquisition or management activities. Additional funds shall be based on the adjusted market value of compensation lands at the time of construction to acquire and manage habitat. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as described in Section 3.i. of Condition of Certification BIO-17.

   a. Criteria for Burrowing Owl Mitigation Lands. The terms and conditions of this acquisition or easement shall be as described in Paragraph 1 of **BIO-17** [Desert Tortoise Compensatory Mitigation], with the additional criteria to include: 1) the mitigation land must provide suitable habitat for burrowing owls, and 2) the acquisition lands must either currently support burrowing owls or be within dispersal distance from an active burrowing owl nesting territory (generally approximately 5 miles). The burrowing owl mitigation lands may be included with the desert tortoise mitigation lands ONLY if these two burrowing owl criteria are met. If the burrowing owl mitigation land is separate from the acquisition required for desert tortoise compensation lands, the Project owner shall fulfill the requirements described below in this condition.

b. Security. If burrowing owl mitigation land is separate from the acreage required for desert tortoise compensation lands the Project owner or an approved third party shall complete acquisition of the proposed compensation lands prior to initiating ground-disturbing Project activities. Alternatively, financial assurance can be provided by the Project owner to the CPM with copies of the document(s) to CDFG, BLM and the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measure described in this condition. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") prior to initiating ground-disturbing Project activities. Prior to submittal to the CPM, the Security shall be approved by the CPM, in consultation with CDFG, BLM and the USFWS to ensure funding. The estimated costs of enhancement and endowment are discussed in condition **BIO-17**. The final amount due will be determined by the PAR analysis conducted pursuant to **BIO-17.**

Verification: If pre-construction surveys detect burrowing owls within 500 feet of proposed construction activities, the Designated Biologist shall provide to the CPM, BLM, CDFG and USFWS documentation indicating that non-disturbance buffer fencing has been installed at least 10 days prior to the start of any construction-related ground disturbance activities. The Project owner shall report monthly to the CPM, CDFG, BLM and USFWS for the duration of construction on the implementation of burrowing owl avoidance and minimization measures. Within 30 days after completion of construction the Project owner shall provide to the CPM, BLM, CDFG and USFWS a written construction termination report identifying how mitigation measures described in the plan have been completed.

If pre-construction surveys detect burrowing owls within the Project Disturbance Area, the Project owner shall notify the CPM, BLM, CDFG and USFWS no less than 10 days of completing the surveys that a relocation of owls is necessary. The Project owner shall do all of the following if relocation of one or more burrowing owls is required:

a. Within 30 days of completion of the burrowing owl pre-construction surveys, submit to the CPM, CDFG and USFWS a Burrowing Owl Relocation and Mitigation Plan.

b. No less than 90 days prior to acquisition of the burrowing owl compensation lands, the Project owner, or an approved third party, shall submit a formal acquisition proposal to the CPM, CDFG, and USFWS describing the 39-acre parcel intended for purchase. At the same time the

Project owner shall submit a PAR or PAR-like analysis for the parcels for review and approval by the CPM, CDFG and USFWS.

c. Within 90 days of the land or easement purchase, as determined by the date on the title, the Project owner shall provide the CPM with a management plan for review and approval, in consultation with CDFG, BLM and USFWS, for the compensation lands and associated funds.

d. No later than 30 days prior to the start of construction-related ground disturbing activities, the Project owner shall provide written verification of Security in accordance with this condition of certification.

e. No later than 18 months after the start of construction-related ground disturbance activities, the Project owner shall provide written verification to the CPM, BLM, CDFG and USFWS that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient.

f. On January 31st of each year following construction for a period of five years, the Designated Biologist shall provide a report to the CPM, USFWS, BLM and CDFG that describes the results of monitoring and management of the burrowing owl relocation area. The annual report shall provide an assessment of the status of the relocation area with respect to burrow function and weed infestation, and shall include recommendations for actions the following year for maintaining the burrows as functional burrowing owl nesting sites and minimizing the occurrence of weeds.

BURROWING OWL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-21 The Project owner shall implement the following measures to avoid, minimize and offset impacts to burrowing owls. Nothing in this condition requires the project owner to conduct burrowing owl surveys by entering private lands adjacent to the project site when the project owner has made reasonable attempts to obtain permission to enter the property for survey work but was unable to obtain such permission. In this situation only, the project owner may substitute binocular surveys for protocol field surveys:

1. Pre-Construction Surveys. The Designated Biologist or Biological Monitor shall conduct pre-construction surveys for burrowing owls no more than 30 days prior to initiation of construction activities. Surveys shall be focused exclusively on detecting burrowing owls, and shall be conducted from two hours before sunset to one hour after or from one hour before to two hours after sunrise. The survey area shall include the Project Disturbance Area and surrounding 500 foot survey buffer.

2. Implement Avoidance Measures. If an active burrowing owl burrow is detected within 500 feet from the Project Disturbance Area the following avoidance and minimization measures shall be implemented:

   a. Establish Non-Disturbance Buffer. Fencing shall be installed at a 250-foot radius from the occupied burrow to create a non-disturbance buffer around the burrow. The non-disturbance buffer and fence line may be reduced to 160 feet if all Project-related activities that might disturb burrowing owls would be conducted during the non-breeding season (September 1st through January 31st). Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.

   b. Monitoring: If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1 – August 31st) the Designated Biologist or Biological Monitor shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall implement measures to minimize or avoid such disturbance.

3. Passive Relocation of Burrowing Owls. If pre-construction surveys indicate the presence of burrowing owls within the Project Disturbance Area (the Project Disturbance Area means all lands disturbed in the construction and operation of the Genesis Project), the Project owner shall prepare and implement a Burrowing Owl Relocation and Mitigation Plan, in addition to the avoidance measures described above. The final Burrowing Owl Relocation and Mitigation Plan shall be approved by the CPM, in consultation with USFWS, BLM and CDFG, and shall:

   a. Identify and describe suitable relocation sites within 1 mile of the Project Disturbance Area, and describe measures to ensure that burrow installation or improvements would not affect sensitive species habitat or existing burrowing owl colonies in the relocation area;

   b. Provide guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl, including a discussion of timing of burrow improvements, specific location of burrow installation, and burrow design. Design of the artificial burrows shall be consistent with CDFG guidelines (CDFG 1995) and shall be approved by the CPM in consultation with CDFG, BLM and USFWS;

c. Passive relocation sites shall be in areas of suitable habitat for burrowing owl nesting, and be characterized by minimal human disturbance and access. Relative cover of non-native plants within the proposed relocation sites shall not exceed the relative cover of non-native plants in the adjacent habitats;

d. Provide detailed methods and guidance for passive relocation of burrowing owls occurring within the Project Disturbance Area; and

4. Acquire Compensatory Mitigation Lands for Burrowing Owls. The following measures for compensatory mitigation shall apply only if burrowing owls that are detected within the Project Disturbance Area. The Project owner shall acquire, in fee or in easement, 19.5 acres of land for each burrowing owl that is displaced by construction of the Project. This compensation acreage of 19.5 acres per single bird or pair of nesting owls assumes that there is no evidence that the compensation lands are occupied by burrowing owls. If burrowing owls are observed to occupy the compensation lands, then only 9.75 acres per single bird or pair is required, per CDFG (1995) guidelines. If the compensation lands are contiguous to currently occupied habitat, then the replacement ratio will be 13.0 acres per pair or single bird. The Project owner shall provide funding for the enhancement and long-term management of these compensation lands. The acquisition and management of the compensation lands may be delegated by written agreement to CDFG or to a third party, such as a non-governmental organization dedicated to habitat conservation, subject to approval by the CPM, in consultation with CDFG and USFWS prior to land acquisition or management activities. Additional funds shall be based on the adjusted market value of compensation lands at the time of construction to acquire and manage habitat. In lieu of acquiring lands itself, the Project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF), as described in Section 3.i. of Condition of Certification BIO-17.

   a. Criteria for Burrowing Owl Mitigation Lands. The terms and conditions of this acquisition or easement shall be as described in Paragraph 1 of Condition of Certification **BIO-17** [Desert Tortoise Compensatory Mitigation], with the additional criteria to include: 1) the mitigation land must provide suitable habitat for burrowing owls, and 2) the

acquisition lands must either currently support burrowing owls or be within dispersal distance from an active burrowing owl nesting territory (generally approximately 5 miles). The burrowing owl mitigation lands may be included with the desert tortoise mitigation lands ONLY if these two burrowing owl criteria are met. If the burrowing owl mitigation land is separate from the acquisition required for desert tortoise compensation lands, the Project owner shall fulfill the requirements described below in this condition.

b. Security. If burrowing owl mitigation land is separate from the acreage required for desert tortoise compensation lands the Project owner or an approved third party shall complete acquisition of the proposed compensation lands prior to initiating ground-disturbing Project activities. Alternatively, financial assurance can be provided by the Project owner to the CPM with copies of the document(s) to CDFG, BLM and the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measure described in this condition. These funds shall be used solely for implementation of the measures associated with the Project. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of security ("Security") prior to initiating ground-disturbing Project activities. Prior to submittal to the CPM, the Security shall be approved by the CPM, in consultation with CDFG, BLM and the USFWS to ensure funding. The estimated costs of enhancement and endowment shall be based upon land acquisition and management costs as discussed in Condition of Certification **BIO-17** and shall include all associated costs as described in that Condition. See **Revised Biological Resources Tables 5** and **7**. This amount may be revised by the CPM in consultation with DFG, BLM and USFWS, based on further analysis of long-term management and maintenance costs. The final amount due will be determined by the PAR analysis conducted pursuant to Condition of Certification **BIO-17**.

Verification: If pre-construction surveys detect burrowing owls within 500 feet of proposed construction activities, the Designated Biologist shall provide to the CPM, BLM, CDFG and USFWS documentation indicating that non-disturbance buffer fencing has been installed at least 10 days prior to the start of any construction-related ground disturbance activities. The Project owner shall report monthly to the CPM, CDFG, BLM and USFWS for the duration of construction on the implementation of burrowing owl avoidance and minimization measures. Within 30 days after completion of construction the Project owner shall provide to

the CPM, BLM, CDFG and USFWS a written construction termination report identifying how mitigation measures described in the plan have been completed.

If pre-construction surveys detect burrowing owls within the Project Disturbance Area, the Project owner shall notify the CPM, BLM, CDFG and USFWS no less than 10 days of completing the surveys that a relocation of owls is necessary. The Project owner shall do all of the following if relocation of one or more burrowing owls is required:

a. Within 30 days of completion of the burrowing owl pre-construction surveys, submit to the CPM, CDFG and USFWS a Burrowing Owl Relocation and Mitigation Plan.

b. No less than 90 days prior to acquisition of the burrowing owl compensation lands, the Project owner, or an approved third party, shall submit a formal acquisition proposal to the CPM, CDFG, and USFWS describing the 39-acre parcel intended for purchase. At the same time the Project owner shall submit a PAR or PAR-like analysis for the parcels for review and approval by the CPM, CDFG and USFWS.

c. Within 90 days of the land or easement purchase, as determined by the date on the title, the Project owner shall provide the CPM with a management plan for review and approval, in consultation with CDFG, BLM and USFWS, for the compensation lands and associated funds.

d. No later than 30 days prior to the start of construction-related ground disturbing activities, the Project owner shall provide written verification of Security in accordance with this condition of certification.

e. No later than 18 months after the start of construction-related ground disturbance activities, the Project owner shall provide written verification to the CPM, BLM, CDFG and USFWS that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient.

f. On January 31st of each year following construction for a period of five years, the Designated Biologist shall provide a report to the CPM, USFWS, BLM and CDFG that describes the results of monitoring and management of the burrowing owl relocation area. The annual report shall provide an assessment of the status of the relocation area with respect to burrow function and weed infestation, and shall include recommendations for actions the following year for maintaining the burrows as functional burrowing owl nesting sites and minimizing the occurrence of weeds.

AVIAN PROTECTION PLAN / MONITORING BIRD IMPACTS FROM SOLAR TECHNOLOGY

BIO-22 The project owner shall prepare and implement an Avian and Bat

Protection Plan to monitor bird and bat collisions with facility features (study described below). The Project owner shall use the monitoring data to inform and develop an adaptive management program that would avoid and minimize Project-related avian and bat impacts. Project-related bird and bat deaths or injuries shall be reported to the CPM, CDFG and USFWS. The CPM, in consultation with CDFG and USFWS, shall determine if the Project-related bird or bat deaths or injuries warrant implementation of adaptive management measures contained in the Avian and Bat Protection Plan. The study design for the Avian and Bat Protection Plan shall be approved by the CPM in consultation with CDFG and USFWS, and, once approved, shall be incorporated into the project's BRMIMP and implemented. The Plan shall include adaptive management strategies that include the placement of bird flight diverters, aerial markers, or other strategies to minimize collisions with the SunCatcher units.

The Avian and Bat Protection Plan shall include a Bird Monitoring Study to monitor the death and injury of birds and bats from collisions with facility features such as reflective mirror-like surfaces and from heat, and bright light from concentrating sunlight. The study design shall be approved by BLM's Wildlife Biologist and the CPM in consultation with CDFG and USFWS, and shall be incorporated into the project's BRMIMP and implemented. The Bird Monitoring Study shall be based upon prior studies by McCrary et al. (1986) or other applicable literature including the Region 8 Interim Guidelines for the Development of a Project-Specific Avian and Bat Protection Plan for Solar Energy Plants and Related Transmission Facilities (USFWS 2010), and shall include detailed specifications on data and carcass collection protocol and a rationale justifying the proposed schedule of carcass searches. The study shall also include seasonal trials to assess bias from carcass removal by scavengers as well as searcher bias and proposed disposition of dead or injured birds.

Verification: No more than 30 days following the publication of the Energy Commission License Decision or BLM's Record of Decision/ROW Issuance, whichever comes first, the project owner shall submit to the CPM, BLM's Wildlife Biologist, USFWS and CDFG a final Avian Protection Plan. Modifications to the Avian Protection Plan shall be made only after approval from BLM's Wildlife Biologist and the CPM.

For one year following the beginning of power plant operation, the Designated Biologist shall submit quarterly reports to BLM's Wildlife Biologist , CPM, CDFG, and USFWS describing the methods, dates, durations, and results of monitoring. The quarterly reports shall provide a detailed description of any project-related bird or wildlife deaths or injuries detected during the monitoring study or at any other time. Following the completion of the fourth quarter of monitoring the Designated Biologist shall prepare an Annual Report that summarizes the year's

data, analyzes any project-related bird fatalities or injuries detected, and provides recommendations for future monitoring and any adaptive management actions needed. The Annual Report shall be provided to the CPM, BLM's Wildlife Biologist, CDFG, and USFWS. Quarterly reporting shall continue until BLM's Wildlife Biologist and the CPM, in consultation with CDFG and USFWS determine whether more years of monitoring are needed, and whether mitigation and adaptive management measures are necessary. After the Bird Monitoring Study is determined by BLM's Wildlife Biologist and the CPM to be complete, the project owner or contractor shall prepare a paper that describes the study design and monitoring results to be submitted to the CPM, BLM's Wildlife Biologist, CDFG, USFWS, and a peer-reviewed scientific journal. Proof of submittal shall be provided to BLM's Wildlife Biologist and the CPM within one year of concluding the monitoring study.

NELSON'S BIGHORN SHEEP MITIGATION

BIO-23 The Designated Biologist or Biological Monitor shall be responsible for daily binocular scans of the project area and surrounding hills and bajadas to search for Nelson's bighorn sheep. At any time bighorn sheep are seen within 2000 feet of any active construction site, the Designated Biologist or Biological Monitor shall monitor their activity until the animals leave the area. If the bighorn sheep approach within 500 feet of any active construction site, then construction shall cease until the animals have moved farther than 500 feet away from construction activities, even if construction is occurring within an area that had been fenced with tortoise exclusion fencing. This buffer may be modified with the approval of the CPM, BLM, and CDFG. In addition, the project owner shall provide resource agency staff and private conservation foundation staff and volunteers permanent access to the Cady Mountains via Hector Road or another suitable route for any activities related to Nelson's bighorn sheep monitoring or management.

Verification: Impact minimization measures and implementation methods for Nelson's bighorn sheep and their implementation methods shall be included in the final BRMIMP and implemented during construction and operation of the project. Implementation of the measures shall be reported in the Monthly Compliance Reports by the Designated Biologist.

AMERICAN BADGER AND DESERT KIT FOX IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-24 Prior to ground disturbance the project owner shall conduct pre-construction surveys for American badgers and desert kit fox. These surveys may be conducted concurrent with the desert tortoise surveys. Surveys shall be conducted as described below:

Biological Monitors shall perform pre-construction surveys for badger and kit fox dens in the project area, including areas within 90 feet of all project facilities, utility corridors, and access roads. If dens are detected, each den shall be classified as inactive, potentially active, or definitely active.

Inactive dens that would be directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by badgers or kit fox. Potentially active dens that would be directly impacted by construction activities shall be monitored by the Biological Monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand.

Occupied badger dens shall be flagged and ground-disturbing activities avoided within 50 feet of the occupied den. Maternity dens shall be avoided during the pup-rearing season (15 February through 1 July) and a minimum 200-foot disturbance-free buffer established. Buffers may be modified with the concurrence of CDFG and CPM. Maternity dens shall be flagged for avoidance, identified on construction maps, and a biological monitor shall be present during construction.
If avoidance of a non-maternity den is not feasible, badgers shall be relocated or allowed to escape the project area (e.g., by providing a temporary monitored opening in the tortoise exclusion fence and directing the animal toward the opening with temporary plastic construction fencing). If necessary, dens will be slowly excavated (either by hand or mechanized equipment under the direct supervision of the biologist, removing no more that 4 inches at a time) before or after the rearing season (15 February through 1 July). Any relocation of badgers shall occur only after consultation with the CDFG and CPM. A written report documenting the badger removal shall be provided to the CPM within 30 days of relocation. In the event that passive relocation techniques fail for badgers, the Applicant will contact CDFG to explore other relocation options, which may include trapping.

Verification: The project owner shall submit a report to the CPM, BLM, and CDFG within 30 days of completion of badger and kit fox surveys. The report shall describe survey methods, results, mitigation measures implemented, and the results of the mitigation.

BAT IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-25 The project owner shall conduct a survey for roosting bats prior to any ground disturbance activities in all areas within 200 feet of rocky outcrops or the existing BNSF railroad trestles. The project owner shall

also conduct surveys for roosting bats during the maternity season (1 March to 31 July) within 300 feet of project activities at the existing railroad trestles and rocky outcrops. These areas shall be surveyed by a qualified bat biologist, who shall be approved by the Designated Biologist. Surveys shall include a minimum of one day and one evening visit. If active maternity roosts or hibernacula are found, the rock outcrop or trestle occupied by the roost shall be avoided (i.e., not removed) by the project, if feasible. If avoidance of the maternity roost is not feasible, the bat biologist shall survey (through the use of radio telemetry or other CDFG/CPM/BLM-approved methods) for nearby alternative maternity colony sites. If the bat biologist determines in consultation with and with the approval of the CDFG, BLM Wildlife Biologist, and CPM that there are alternative roost sites used by the maternity colony and young are not present, then no further action is required. However, if there are no alternative roost sites used by the maternity colony, provision of substitute roosting bat habitat is required. If active maternity roosts are absent, but a hibernaculum (i.e., a non-maternity roost) is present, then exclusion of bats prior to demolition of roosts is required.

1. Provision of substitute roosting bat habitat. If a maternity roost will be impacted by the project, and no alternative maternity roosts are in use within 1 mile of the site, substitute roosting habitat for the maternity colony shall be provided on, or in close proximity to, the project site no less than three months prior to the eviction of the colony. Alternative roost sites will be constructed in accordance with the specific bats' requirements in coordination with CDFG, BLM Wildlife Biologist, and the CPM. Alternative roost sites must be of comparable size and proximal in location to the impacted colony. The CDFG shall also be notified of any hibernacula or active nurseries within the construction zone.

2. Exclude bats prior to demolition of roosts. If non-breeding bat hibernacula are found in rocky outcrops scheduled to be removed or in crevices in rock outcrops within the grading footprint, the individuals shall be safely evicted, according to timing and under the direction of the qualified bat biologist, by opening the roosting area to allow airflow through the cavity or other means determined appropriate by the bat biologist (e.g., installation of one-way doors). In situations requiring one-way doors, a minimum of one week shall pass after doors are installed and temperatures should be sufficiently warm for bats to exit the roost. This action should allow all bats to leave during the course of one week. Roosts that need to be removed in situations where the use of one-way doors is not necessary in the judgment of the qualified bat biologist shall first be disturbed by various means at the direction of the bat biologist at dusk to allow bats to escape during the darker hours, and the roost

tree shall be removed or the grading shall occur the next day (i.e., there shall be no less or more than one night between initial disturbance and the grading or tree removal).

If an active maternity roost is located in an area to be impacted by the project, and alternative roosting habitat is available, the demolition of the roost site must commence before maternity colonies form (i.e., prior to 1 March) or after young are flying (i.e., after 31 July) using the exclusion techniques described above.

Verification: The project owner shall submit a report to the CPM, the BLM Wildlife Biologist, and the CDFG within 30 days of completion of roosting bat surveys and any subsequent mitigation. The report shall describe survey methods, results, mitigation measures implemented, and the results of the mitigation.

STREAMBED IMPACT MINIMIZATION AND COMPENSATION MEASURES

BIO-26 The project owner shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to jurisdictional waters of the State and to satisfy requirements of California Fish and Game Code sections 1600 and 1607. Throughout this condition, "jurisdictional" refers to streambeds or acreages of streambed meeting CDFG criteria as waters of the State.

Section A: Acquire Off-Site State Waters.

The project owner shall acquire, in fee or in easement, a parcel or parcels of land that includes no fewer than 152.3 acres of State jurisdictional waters. Prior to construction the applicant shall map the vegetation with emphasis on desert wash, including microphyll woodland, communities within the drainages subject to project disturbance and provide a map to the CPM, CDFG and BLM. The parcel or parcels comprising the 152.3 acres of ephemeral washes shall include the same types of vegetation as mapped in the project footprint.

This compensation acreage may be included ("nested") within the acreage acquired and managed as desert tortoise habitat compensation (Condition of Certification **BIO-17**) only if:

- Adequate acreage of qualifying state-jurisdictional streambed delineated within the desert tortoise compensation lands;
- The desert tortoise habitat compensation lands are acquired and dedicated as permanent conservation lands within 18 months of the start of project construction.

If these two criteria are not met, then the project owner shall provide no fewer than 152.3 acres of state-jurisdictional streambed compensation

lands independent of any compensation land required under other conditions of certification (adjusted to reflect the final project footprint and expert's delineation of streambed on the compensation lands), and shall also provide funding for the initial improvement and long-term maintenance and management of the acquired lands, and to comply with other related requirements this condition. Costs of these requirements cannot be estimated in advance because jurisdictional streambed would make up only a small portion of any acquired parcel and might vary widely among available parcels. In general, however the total costs shall be based upon land acquisition and management costs as discussed in Condition of Certification **BIO-17** and shall include all associated costs as described in that Condition. This amount may be revised by the CPM in consultation with DFG, BLM and USFWS, based on further analysis of long-term management and maintenance costs. See **Biological Resources Addendum Tables 5** and **9**. The terms and conditions of this acquisition or easement shall be as described in Condition of Certification **BIO-17**. Mitigation for impacts to State waters shall occur within the surrounding watersheds, as close to the project site as possible.

The project owner may elect to comply with the requirements in this condition for acquisition of compensation lands, initial protection and habitat improvement on the compensation lands, or long-term maintenance and management of the compensation lands by funding, or any combination of these three requirements, by providing funds to implement those measures into the Renewable Energy Action Team (REAT) Account established with the National Fish and Wildlife Foundation (NFWF). To use this option, the Project owner must make an initial deposit to the REAT Account in an amount equal to the estimated costs of implementing the requirement. If the actual cost of the acquisition, initial protection and habitat improvements, or long-term funding is more than the estimated amount initially paid by the project owner, the project owner shall make an additional deposit into the REAT Account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, or the long-term funding requirements as established in an approved PAR or PAR-like analysis. If those actual costs or PAR projections are less than the amount initially transferred by the applicant, the remaining balance shall be returned to the project owner.

The responsibility for acquisition of compensation lands may be delegated to a third party other than NFWF, such as a non-governmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with CDFG, BLM and USFWS, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third

party, or to manage compensation lands, shall be executed and implemented within 18 months of the Energy Commission's certification of the project.

Management Plan for Acquired Lands: The project owner shall prepare and submit to Energy Commission CPM and CDFG a draft Management Plan that reflects site-specific enhancement measures for the drainages on the acquired compensation lands. The objective of the Management Plan shall be to enhance the wildlife value of the drainages, and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control. Where applicable, the management plan should be integrated with desert tortoise compensation land habitat management planning requirements as described in **BIO-17**.

Section B: On-site Measures:

1. Copies of Requirements, Stop Work Authority: The project owner shall provide a copy of the Streambed Impact Minimization and Compensation Measures to all contractors, subcontractors, and the applicant's project supervisors. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any CDFG personnel or personnel from another agency upon demand. The CPM reserves the right to issue a stop work order after giving notice to the project owner, if the CPM, in consultation with CDFG, determines that the project owner is not in compliance with any of the requirements of this condition, including but not limited to the existence of any of the following:

    a. The information provided by the applicant regarding streambed alteration is incomplete or inaccurate;

    b. New information becomes available that was not known to the Energy Commission at the time of project certification; or

    c. The project or project activities as described in the Supplemental Staff Assessment/ Final Environmental Impact Statement have changed.

2. Best Management Practices: The project owner shall comply with the following conditions to protect drainages near the Project Disturbance Area:

    a. The project owner shall not operate vehicles or equipment in ponded or flowing water except as described in this condition.

    b. With the exception of the retention basins and drainage control system installed for the project the installation of bridges, culverts, or other structures shall be such that water flow (velocity and low flow channel width) is not impaired. Bottoms of

temporary culverts shall be placed at or below stream channel grade.

c. When any activity requires moving of equipment across a flowing drainage, such operations shall be conducted without substantially increasing stream turbidity.

d. Vehicles driven across ephemeral drainages when water is present shall be completely clean of petroleum residue and water levels shall be below the vehicles' axels.

e. The project owner shall minimize road building, construction activities and vegetation clearing within ephemeral drainages to the extent feasible.

f. The project owner shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter ephemeral drainages or be placed in locations that may be subjected to high storm flows.

g. The project owner shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws, and it shall be the responsibility of the project owner to ensure compliance.

h. Spoil sites shall not be located at least 30 feet from the boundaries and drainages or in locations that may be subjected to high storm flows, where spoils might be washed back into drainages.

i. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from project-related activities, shall be prevented from contaminating the soil and/or entering waters of the State. These materials, placed within or where they may enter a drainage by the project owner or any party working under contract or with the permission of the project owner, shall be removed immediately.

j. No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, waters of the State.

k. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any drainage.

l. No equipment maintenance shall occur within 150 feet of any ephemeral drainage where petroleum products or other pollutants from the equipment may enter these areas under any flow.

m. Stationary equipment such as motors, pumps, generators, and welders, located within or adjacent to a drainage shall be positioned over drip pans. Stationary heavy equipment shall have suitable containment to handle a catastrophic spill/leak. Clean up equipment such as booms, absorbent pads, and skimmers, shall be on site prior to the start of construction.

n. The cleanup of all spills shall begin immediately. The CDFG, BLM Wildlife Biologist, and CPM shall be notified immediately by the project owner of any spills and shall be consulted regarding clean-up procedures.

3. Non-Native Vegetation Removal. The owner shall remove any non-native vegetation (Consistent with the Weed Management Plan, see Condition of Certification **BIO-11**) from any on-site portion of any drainage that requires the placement of a bridge, culvert or other structure. Removal shall be done at least twice annually (Spring/Summer) throughout the life of the Project.

4. Reporting of Special-Status Species: If any special-status species are observed on or in proximity to the project site, or during project surveys, the project owner shall submit California Natural Diversity Data Base (CNDDB) forms and maps to the CNDDB within five working days of the sightings and provide the regional CDFG office with copies of the CNDDB forms and survey maps. The CNDDB form is available online at: www.dfg.ca.gov/whdab/pdfs/natspec.pdf. This information shall be mailed within five days to: California Department of Fish and Game, Natural Diversity Data Base, 1807 13th Street, Suite 202, Sacramento, CA 95814, (916) 324-3812. A copy of this information shall also be mailed within five days to CDFG, BLM Wildlife Biologist, and the CPM.

5. Notification: Prior to any activities that cross or have the potential to impact any jurisdictional drainage, the project owner shall provide a detailed map to the CDFG, BLM Wildlife Biologist, and CPM in a GIS format that identifies all potential crossings of jurisdictional habitats including retention basins, detention basins, reconfigured channels and culverts. The maps shall identify the type of crossing proposed by the owner such as bridges, culverts, or other mechanism and the best management practices that would be employed. The project owner shall notify the CPM, BLM Wildlife Biologist, and CDFG, in writing, at least five days prior to initiation of project activities in jurisdictional areas and at least five days prior

to completion of project activities in jurisdictional areas. The project owner shall notify the CPM, BLM Wildlife Biologist, and CDFG of any change of conditions to the project, the jurisdictional impacts, or the mitigation efforts, if the conditions at the site of the proposed project change in a manner which changes risk to biological resources that may be substantially adversely affected by the proposed project. The notifying report shall be provided to the CPM, BLM Wildlife Biologist, and CDFG no later than 7 days after the change of conditions is identified. As used here, change of condition refers to the process, procedures, and methods of operation of a project; the biological and physical characteristics of a project area; or the laws or regulations pertinent to the project, as described below. A copy of the notifying change of conditions report shall be included in the annual reports.

a. Biological Conditions: a change in biological conditions includes, but is not limited to, the following: 1) the presence of biological resources within or adjacent to the project area, whether native or non-native, not previously known to occur in the area; or 2) the presence of biological resources within or adjacent to the project area, whether native or non-native, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

b. Physical Conditions: a change in physical conditions includes, but is not limited to, the following: 1) a change in the morphology of a river, stream, or lake, such as the lowering of a bed or scouring of a bank, or changes in stream form and configuration caused by storm events; 2) the movement of a river or stream channel to a different location; 3) a reduction of or other change in vegetation on the bed, channel, or bank of a drainage, or 4) changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.

c. Legal Conditions: a change in legal conditions includes, but is not limited to, a change in Regulations, Statutory Law, a Judicial or Court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

Verification: No fewer than 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall implement the mitigation measures described in this condition. No fewer than 30 days prior to the start of work potentially affecting waters of the State, the project owner shall provide written verification (i.e., through incorporation into the BRMIMP) to the CPM and BLM Wildlife Biologist that the above best management practices will be implemented and provide a discussion of work in waters of the State in Compliance Reports for the duration of the project.

Within 30 days after completion of the first year of project construction, the project owner shall provide to the CPM for review and approval a report identifying that appropriate mitigation lands have been obtained, verification of the acreage of state jurisdictional streambeds on the compensation lands (to be delineated using methodology identical to the delineation of on-site jurisdictional streambeds), a draft Management Plan for review and approval by the CPM and CDFG, and verification on ongoing enhancement techniques, and a summary of all modifications made to the existing channels on the project site.

EVAPORATION POND DESIGN, MONITORING, AND MANAGEMENT PLAN

BIO-27 The project owner shall install netting over the evaporation ponds and design and implement an Evaporation Pond Design, Monitoring, and Management Plan (Evaporation Pond Plan) to be based upon the draft Evaporation Pond Plan submitted by the applicant. The Plan shall meet the approval of the USFWS, CDFG, BLM's Wildlife Biologist, and the CPM. The goal of the Evaporation Pond Plan shall be to avoid the potential for wildlife mortality associated with the evaporation ponds. The Evaporation Pond Plan shall include: a discussion of the objectives of the Evaporation Pond Plan; a description of project design features such as side slope specifications, freeboard and depth requirements, covering, and fencing; a discussion on the placement of the evaporation pond as to reduce the potential of collision or electrocution of wildlife near the transmission line; avian, pond, and water quality monitoring for selenium and other Title 20 compounds, management actions such as bird deterrence/hazing and water level management, triggers for those management actions; and annual reporting requirements.

Verification: At least 30 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM, BLM's Wildlife Biologist, USFWS, and CDFG with the final version of the Evaporation Pond Plan that has been reviewed and approved by USFWS, CDFG, and staff. The CPM and BLM's Wildlife Biologist would determine the plan's acceptability within 15 days of receipt of the final plan. All modifications to the approved Evaporation Pond Plan must be made only after consultation the staff, USFWS, and CDFG. The project owner shall notify the CPM and BLM's Wildlife Biologist no less than 5 working days before implementing any BLM- and CPM-approved modifications to the Evaporation Pond Plan.

Within 30 days after completion of evaporation pond construction, the project owner shall provide to the CPM for review and approval a report identifying which items of the Evaporation Pond Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and as-built drawings of the evaporation ponds. Throughout the life of the project, the project owner shall provide annual reports on results of the previous year's evaporation plan monitoring, including but not limited to description and

summary of wildlife mortality, water quality, and management actions taken or proposed.

CHANNEL DECOMMISSIONING AND RECLAMATION PLAN

BIO-28 Upon project closure, the project owner shall implement a final Decommissioning and Reclamation Plan to remove the engineered diversion channels, detention basins, and other sediment control features from the project site. The goal of the plan shall be to restore the site's topography and hydrology to a relatively natural condition and to establish native plant communities within the Project Disturbance Area. The Channel Decommissioning and Reclamation Plan shall include a cost estimate for implementing the proposed decommissioning and reclamation activities. The plan and cost estimate shall be consistent with the guidelines in BLM's 43 CFR 3809.550 et seq., subject to review and revisions from BLM's Wildlife Biologist and the CPM in consultation with USFWS and CDFG.

Verification: No less than 90 days from publication of the Energy Commission Decision or the Record of Decision, whichever comes first, the project owner shall provide to BLM's Wildlife Biologist and the CPM an agency-approved final Channel Decommissioning and Reclamation Plan. Modifications to the approved Channel Decommissioning Plan shall be made only after approval from BLM's Wildlife Biologist and the CPM, in consultation with USFWS, and CDFG.

No more than 10 days prior to initiating project-related ground disturbance activities the project owner shall provide financial assurances to BLM's Wildlife Biologist and the CPM to guarantee that an adequate level of funding would be available to implement measures described in the Channel Decommissioning and Reclamation Plan, pursuant to 43 CFR 3809.550 et seq.

CLOSURE PLAN MEASURES

BIO-29 The project owner shall implement and incorporate into the facility closure plan measures to address the local biological resources related to facility closure. A funding mechanism shall be developed in consultation with staff to ensure sufficient funds are available for revegetation, reclamation, and decommissioning. The facility closure plan shall address biological resources-related mitigation measures. In addition to these measures, the plan must include the following:

1. Removal of transmission conductors when they are no longer used and useful;

2. Removal of all above-ground and subsurface power plant site facilities and related facilities;

3. Methods for restoring wildlife habitat and promoting the re-establishment of native plant and wildlife species;

4. Revegetation of the project site and other disturbed areas utilizing appropriate methods for establishing native vegetation; components of the revegetation plan, including performance standards and monitoring, shall be as described in Condition of Certification **BIO-10**;

5. A cost estimate to complete closure-related activities, to be based upon decommissioning costs required under 43 CFR 3809.550 et seq.

6. An implementation and monitoring plan to ensure successful and satisfactory completion of every element of the Facility Closure Plan.

In addition, the project owner shall secure funding to ensure implementation of the plan and provide to the CPM and BLM Wildlife Biologist written evidence of the dedicated funding mechanism(s). The financial assurances may be in the form of an irrevocable letter of credit, a performance bond, a pledged savings account, or another equivalent form of security, as approved by the CPM and BLM Wildlife Biologist.

Verification: Prior to initiating ground-disturbing project activities, the project owner shall provide financial assurances (as described in this condition, above) to the CPM and BLM Wildlife Biologist to guarantee that an adequate level of funding will be available to implement decommissioning and closure activities described above.

At least 12 months prior to commencement of planned closure activities, the project owner shall address all biological resources-related issues associated with facility closure, and provide final measures, in a Biological Resources Element. The draft planned permanent or unplanned closure measures shall be submitted to the CPM, BLM Wildlife Biologist, CDFG, and USFWS. After revision, final measures shall comprise the Biological Resources Element, which shall include the items listed above as well as written evidence of the dedicated funding mechanism(s) for these measures. The final Biological Resources Element shall become part of the facility closure plan, which is submitted to the CPM and BLM Wildlife Biologist within 90 days of the permanent closure or another period of time agreed to by the CPM and BLM Wildlife Biologist.

In the event of an unplanned permanent closure, or an indeterminate suspension of operations, the project owner shall notify the CPM and BLM Wildlife Biologist , as well as other responsible agencies, by telephone, fax, or e-mail, within 24

hours and shall take all necessary steps to implement the on-site contingency plan (see **Compliance** Conditions of Certification).

Upon facility closure, the project owner shall implement measures in the Biological Resources Element and provide written status updates on all closure activities to the CPM and BLM Wildlife Biologist at a frequency determined by the CPM and BLM Wildlife Biologist.

IN-LIEU FEE MITIGATION OPTION

BIO-30 The Project owner may choose to satisfy certain compensatory mitigation obligations identified in this Decision by paying an in lieu fee to the Department of Fish and Game pursuant to Fish and Game code sections 2069 and 2099, to the extent the in-lieu fee provision is found by the Commission to be in compliance with CEQA and CESA requirements.

Verification: If electing to use this provision, the Project owner shall notify the Commission that it would like a determination that the in-lieu fee proposal meets CEQA and CESA requirements.

PROJECT CONSTRUCTION AND COMPENSATION PHASING PLAN

BIO-31 As an alternative to providing mitigation or security for the entire project prior to the start of the first ground-disturbing activities, the Project Owner may elect to provide compensatory mitigation for the total Project Disturbance Area in two phases and may elect to provide security in three phases as specified in this condition.

Only the phases identified as Phase 1a, Phase 1b, and Phase 2, as described in this condition, in text and maps provided on September 10, 2010 by the Project Owner (tn: 58411, Applicant's submittal of Updated Reduced Project Boundary Scenarios 5.5 or Figures 17 and 18 [Scenario 5.5]) may be used for the phasing of mitigation and security requirements. To the extent those sources are found to contain conflicting information about Project phasing, the description in this condition shall control. In particular, the Project Owner has divided the project's Phase 1 activities into two separate sub-phases, identified as Phase 1a and Phase 1b, since the Supplemental Staff Assessment was prepared. This condition presumes that the phases identified in this condition are identical to the phases that the Bureau of Land Management (BLM) will authorize work on through issuance of "notices to proceed"; if phases used by BLM are not identical to the phases as described in this condition and the materials identified above, the Project Owner shall obtain separate written authorization from the CPM prior to beginning work on each of the three phases.

For purposes of this condition:

> "Project Disturbance Area" or "ground disturbance area" means all areas that will be temporarily or permanently disturbed during construction or operation of the Project, including all linear facilities.
>
> "Project footprint" means the Project Disturbance Area and undeveloped areas inside the Project's boundaries that will no longer provide functional habitat value, including but not limited to desert tortoise habitat, Mojave fringe-toed lizard habitat, burrowing owl habitat, rare plant habitat, and areas within ephemeral washes and drainages.
>
> "Project construction" or "construction" means any ground-disturbing activity, including but not limited to construction work, site mobilization, fence construction, or any tortoise translocation activities.
>
> "Security" means the security that is required under other biological conditions of certification to ensure required mitigation measures will be implemented, or payments by the Project Owner into the National Fish and Wildlife Service mitigation account in accordance with the option provided in other conditions of certification.

Overview of Project Phases

Phase 1a is strictly limited to construction of the main access road, the waterline, the Main Services Area, the substation area, the installation of 60 SunCatcher pedestals, the temporary at-grade crossing over the Burlington Northern Santa Fe (BNSF) railroad tracks, the permanent bridge spanning the railroad tracks, and any surveys, translocations, or other activities required within the Phase 1a area that are required by Commission Conditions of Certification. The ground disturbance area during Phase 1a shall be no greater than 250 acres and shall be limited to the geographic areas indicated on the maps identified above.

Phase 1b is strictly limited to construction of solar fields and related facilities located throughout the remainder of the area identified as Phase 1 in the Supplemental Staff Assessment and in applicant's Scenario 5.5 6 (tn: 58411, Applicant's submittal of Updated Reduced Project Boundary Scenarios 5.5 Information), and any surveys, translocations, or other activities required within the Phase 1b area that are required by Commission Conditions of Certification. The ground disturbance area during Phase 1b shall be limited to the areas indicated on the maps identified above.

Phase 2 is strictly limited to the remainder of the project site as identified as Scenario 5.5 in applicant's maps (tn: 58411, Applicant's submittal of Updated Reduced Project Boundary Scenarios 5.5).

General Requirements

At no time may the Project Owner cause ground-disturbance to any location outside of the area that has been approved for construction according to the phasing plan identified in this Condition of Certification.

Prior to initiating construction in any phase of the Project, the Project Owner shall comply with all pre-construction requirements in this and other Conditions of Certification and shall notify the CPM that it has obtained a Notice to Proceed for the phase or subphase from the BLM.

Construction activities, including work on linear and non-linear features, shall not occur outside desert tortoise exclusion areas that have been fenced and cleared in accordance with USFWS protocols and as described in Condition of Certification **BIO-15** (Desert Tortoise Clearance and Exclusion Fencing).

The Project Owner shall provide security to ensure implementation of the mitigation requirements in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization)**, BIO-13** (Mojave Fringe-Toed Lizard Mitigation), **BIO-16** (Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-26** (Streambed Impact Minimization and Compensation Measures) for each of the three phases prior to any Project construction associated with that phase. Phasing of security only applies to security required by the Conditions listed above. If the Project Owner elects to phase payments of security, the amount of the security (including payments to NFWF [see definition of security above]) will be adjusted by the CPM in consultation with CDFG, BLM and USFWS prior to each phase to reflect the CPM's best estimate at that time of the estimated costs of land acquisition, long-term management and maintenance costs, and other costs that are included in the security computation. Those costs may be greater than the costs identified in the Conditions of Certification.

Even when security has been provided, the Project Owner shall complete the acquisition, protection and transfer of all compensation lands required in the Conditions of Certification listed above, as well as all funding requirements associated with those lands, within the time periods identified in those Conditions of Certification, except that the

time period for providing compensation lands and funding associated with both Phases 1a and 1b shall be measured from the start of construction of Phase 1a alone, and the period for providing lands and funding required for Phase 2 activities shall be measured from the start of construction of Phase 2.

Additional requirements within the Project's Conditions of Certification that are not expressly phased in this Condition shall be phased as necessary to carry out the purpose of this condition, or to ensure that no project construction occurs in an area for which the Project Owner has not provided security and obtained permission to begin construction. Examples may include such activities as construction and location of desert tortoise exclusion fencing or timing of pre-construction clearance surveys for other species. The Project Owner shall first obtain approval from the CPM, acting in consultation with BLM, CDFG and USFWS, for the phasing of any requirements or deadlines that are not expressly phased in Conditions of Certification.

Detailed Phasing Requirements

Phased impacts and compensation requirements are described in tables below, by phase.

Phase 1a

Phase 1a would result in the loss or isolation of 250 acres of desert tortoise habitat from the placement of fencing, road construction, and the development of project facilities. The construction and fencing of the temporary and Main Access Road would also result in the temporary isolation of approximately 650 acres of desert tortoise habitat. In addition, proposed Phase 1a Project construction would affect state-jurisdictional streambeds and, possibly, burrowing owl or rare plant locations that are identified during pre-construction and late-season botanical surveys. The applicant shall provide an enumeration of streambed, burrowing owl, and rare plant habitat impacts and shall provide security for required compensation those impacts as described in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization), **BIO-17** (Desert Tortoise Compensatory Mitigation)**,** **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-26** (Streambed Impact Minimization and Compensation Measures) prior to initiating Project construction associated with Phase 1a, as set forth in the verification section of this Condition.

All project access throughout Phase 1a construction shall be via temporary or permanent access as mapped by the applicant. Isolation of desert tortoise habitat between the proposed temporary and permanent construction access routes shall be limited to winter months when tortoises are largely inactive. Desert tortoise exclusion fencing shall be installed along the existing temporary construction access routes prior to other ground disturbance at the project site, and fencing shall be maintained as described in Condition of Certification **BIO-15** (Desert Tortoise Clearance and Exclusion Fencing) until completion of the proposed Main Access Road. Desert tortoise exclusion fencing shall be installed along the proposed Main Access Road alignment prior to beginning construction of that road. If project-related access along the temporary construction access route continues beyond March 15, 2011, the Project Owner shall provide additional security to the CPM for all acreage within the area isolated between the two fenced access routes (estimated by staff as approximately 650 acres) by March 15, 2011 and shall implement desert tortoise clearance surveys and translocation of any tortoises within the isolated area consistent with the requirements of Condition of Certification **BIO-15** (Desert Tortoise Clearance and Exclusion Fencing) . If the Main Access Road is complete by March 15, 2011 and no further project access via the temporary route is necessary, desert tortoise fencing along the temporary access road shall be removed on or before March 15, 2011

BIO-31 Table 1a.
Phase 1a Impacts and Compensation Acreage (Scenario 5.5)

Resource	**Phase 1a Impact (acres) and Mitigation Ratios**	**Compensation (acres)**
Direct impact: Desert tortoise habitat	56 ac. S of BNSF at 1:1 194 ac. N of BNSF at 3:1	56 582
State Jurisdictional streambed [1]	[to be provided by Project Owner] at 1:1	
Mojave fringe-toed lizard [1]	0	0
Additional (burrowing owl, special status plants) [1]	[to be provided by Project Owner] at 3:1	
Total per-acre basis for Phase 1a Security (through 15 March 2011)		**638[2] acres**
Potential impact: Isolation of desert tortoise habitat (after 15 March 2011)	650 acres at 1:1 [staff estimate; to be verified by Project Owner]	650 acres
Total per-acre basis for Phase 1a Security (after 15 March 2011, pending status of temporary access route)		**1,288 [2] acres**

1. Compensation may be nested within desert tortoise compensation land.

2. Acreages to be adjusted upon completion of each construction phase and upon confirmation by CPM in consultation with CDFG, USFWS, and BLM of acres impacted.

Phase 1b

Phase 1b consists of solar generators in the central portion of the project area, north of the BNSF railroad. Phase 1b would directly impact 1,626 acres of desert tortoise habitat. Compensation mitigation ratios for these project components shall be as described in Condition of Certification **BIO-17**(Desert Tortoise Compensatory Mitigation). Construction of stormwater detention basins and debris basins that may be constructed during Phase 1b, pending hydrology analyses and BNSF review pursuant to Condition of Certification **SOIL AND WATER 8** will also result in direct impacts to State jurisdictional streambeds located downstream in portions of Phase 2. For that reason, all jurisdictional waters that occur below any future detention basins may also be included in the calculation of Phase 1b security and in the calculation of Phase 1 mitigation requirements. In addition, proposed Phase 1b Project construction could affect burrowing owl or rare plant locations that may be identified during pre-construction and late-season botanical surveys required in the Conditions of Certification described below. The applicant shall provide the CPM with an enumeration of burrowing owl and rare plant habitat impacts and shall provide security for required compensation of those impacts as described in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization)**,** **BIO-17**(Desert Tortoise Compensatory Mitigation)**,** **BIO-21**(Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-26** (Streambed Impact Minimization and Compensation Measures)**.** Security shall be provided prior to the start of any Phase 1b construction, as set forth in the verification section of this Condition, or prior to September 1, 2011, whichever occurs first.

BIO-31 Table 1b.
Phase 1b Impacts and Compensation Acreage (Scenario 5.5)

Resource	Phase 1b Impact (acres) and Mitigation Ratios	Compensation (acres)
Desert tortoise habitat (excluding disturbed or isolated acreage reported above in Phase 1a)	1,626 at 3:1	4,878 acres
State Jurisdictional streambed [1]	[to be provided by Project Owner] at 1:1	
Mojave fringe-toed lizard [1]	[to be provided by Project Owner] at 1:1 [to be provided by Project	

	Owner] at 3:1	
Additional (burrowing owl, special status plants) [1]	[to be provided by Project Owner]	
Total per-acre basis for Phase 1b Security		**4,878[2] acres**

1. Compensation may be nested within desert tortoise compensation land.
2. Acreages to be adjusted upon completion of each construction phase and upon confirmation by CPM in consultation with CDFG, USFWS, and BLM of acres impacted.

Phase 2

Phase 2 construction would directly impact desert tortoise habitat north and south of BNSF railroad tracks. Phase 2 would impact 2,085 acres of occupied desert tortoise habitat south of the BNSG railroad tracks to be mitigated at a 1:1 ratio. In addition, Scenario 5.5 would impact 369 acres of high-density occupied desert tortoise habitat to be mitigated at the 5:1 ratio. Compensation mitigation ratios for these project components shall be as described in Condition of Certification **BIO-17**(Desert Tortoise Compensatory Mitigation). In addition, proposed Phase 2 Project construction would affect Mojave fringe-toed lizard habitat and could affect burrowing owl or rare plant locations that may be documented during late-season field surveys. The applicant shall provide the CPM an enumeration of burrowing owl, and rare plant habitat impacts and shall provide security for required compensation of those impacts as described in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization)**,** **BIO-13** (Mojave Fringe-Toed Lizard Mitigation), **BIO-**16 (Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-**26 (Streambed Impact Minimization and Compensation Measures) Security shall be provided to the CPM, prior to beginning of any project-related ground disturbing activities, as set forth in the verification section of this Condition.

BIO-31 Table 2.
Phase 2 Impacts and Compensation Acreage.

Resource	**Phase 2 Impact (acres) and Mitigation Ratios**	**Compensation (acres)**
Desert tortoise habitat (excluding disturbed or isolated acreage in Phase 1a; see Table 1a)	2,085 acres S of BNSF at 1:1 283 acres N of BNSF at 3:1	2,085 849
Desert tortoise habitat at 5:1 (Scenario 5.5 only)	369 acres at 5:1	1,845
State Jurisdictional streambed [1]	0	0

Mojave fringe-toed lizard [1]	21.4 acres at 1:1 143.3 acres at 3:1	21.4 429.9
Additional (burrowing owl, special status plants)	To be provided by the Project Owner.	
Total Scenario 5.5 per-acre basis for Phase 2 Security		**5,230[2] acres**

1. Compensation may be nested within desert tortoise compensation land.
2. Acreages to be adjusted upon completion of each construction phase and upon confirmation by CPM in consultation with CDFG, USFWS, and BLM of acres impacted.

Verification: No fewer than 30 days prior to the start of desert tortoise clearance surveys for each phase, the Project owner shall submit a description of the proposed construction activities for that phase to CDFG, USFWS and BLM for review and to the CPM for review and approval. The description for each phase shall include the proposed construction schedule, a figure depicting the locations of proposed construction and number of acres of rare plant habitat, burrowing owl habitat, and state-jurisdictional streambeds to be disturbed.

If all mitigation requirements, including habitat acquisition and protection, are not completed for a Project phase at least 30 days prior to the start of ground-disturbing activities for that phase, the Project Owner shall provide verification to the CPM and CDFG that approved security (as described in Conditions of Certification **BIO-12** (Special-Status Plant Impact and Avoidance and Minimization), **BIO-13** (Mojave Fringe-Toed Lizard Mitigation), **BIO-16** (Desert Tortoise Translocation Plan), **BIO-17** (Desert Tortoise Compensatory Mitigation), **BIO-21** (Burrowing Owl Impact Avoidance and Minimization Measures), and **BIO-26** (Streambed Impact Minimization and Compensation Measures)) has been established in accordance with these Conditions of Certification no later than 30 days prior to beginning ground-disturbing activities for each Phase. Prior to submitting verification regarding the security to the CPM, the project owner shall obtain the CPM's approval of the security as required by the other Conditions For Phase 1b, the Project Owner shall obtain the CPM's approval of security and shall provide verification that approved security has been established by September 1, 2011 or 30 days prior to the start of Phase 1b construction, whichever occurs first. The fixed deadline for Phase 1b security is necessary because under terms of this Condition, compensation lands and associated funding for both Phase 1a and Phase 1b will be due in the first half of 2012, assuming Phase 1a construction begins as planned in late 2010, and security must be in place well in advance of the mitigation obligations that are being guaranteed.

The Project Owner shall provide written verification to the CPM, CDFG, BLM and USFWS of the compensation lands acquisition, protection, and transfer requirements and satisfaction of associated funding requirements as set forth in **BIO-17** and other conditions within the following time frames: (1) For Phase 1a and Phase 1b mitigation, verification shall be provided no later than18 months after the start of construction of Phase 1a, and (2) for Phase 2 mitigation, such

verification shall be provided no later than 18 months after the start of construction of Phase 2. Other verification, notification and reporting requirements and other deadlines set forth in BIO-17 and other Conditions that relate to compensation land requirements, to the option of funding mitigation through the NFWF account, or to use of approved third parties to carry out mitigation requirements also apply to Phase 1 (1a and 1b combined) and to Phase 2.

Within 90 days after completion of all project related ground disturbance for each project phase or sub phase, the project owner shall provide to the CPM, CDFG, BLM and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during Project construction.

B. SOIL AND WATER RESOURCES

This section focuses on the soil and water resources associated with the Calico Solar Project (Calico) as proposed by the Applicant in their reduced acreage Scenario 5.5 on September 10, 2010, including the project's potential to induce erosion and sedimentation, adversely affect water supplies, and degrade water quality. Mitigation measures are included in the Conditions of Certification to ensure that the project will have no significant impacts on the environment and that it will comply with all LORS.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Applicant originally proposed an 850 MW project on 8,230 acres of undeveloped land located within the Mojave Desert in the central portion of San Bernardino County. Subsequent to the Committee Order issued on September 3, 2010, the Applicant proposed two reduced acreage scenarios for the Calico Solar Project site: Scenario 5.5 which will produce approximately 663.5 MW on 4,613 acres and Scenario 6 which will produce approximately 603.9 MW on 4,244 acres within the original project footprint. The site is located approximately 37 miles east of Barstow, California with its southern boundary adjacent to Interstate 40 (I-40) (**Soil and Water Figure** 1 with original project footprint overlay). The project will utilize SunCatchers – 40-foot tall Stirling dish technology developed by the Applicant - which track the sun and focus solar energy onto Power Conversion Units (PCU) to generate electricity. Each PCU consists of a solar receiver heat exchanger and a closed-cycle, high-efficiency Solar Stirling Engine specifically designed to convert solar power to rotary power via a thermal conversion process. The engine drives an electrical generator to produce grid-quality electricity. The site will contain approximately 26,450 SunCatchers and associated equipment and infrastructure within a fenced boundary. (Ex. 300, pp. C.7-9 to C.7-10., Ex. 317 pp. C.7-6 to C.7-7.)

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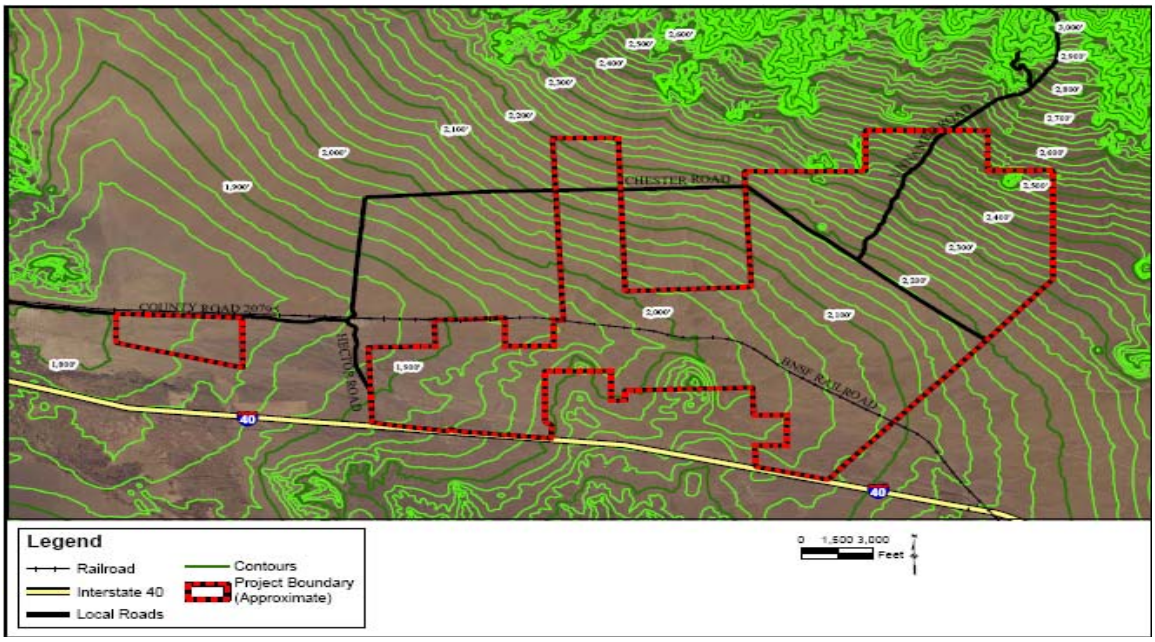
Soil and Water - Figure 1



Source: Exhibit 300

Site construction will be accomplished in two phases, Phase 1 (including Phases 1A and 1B) and Phase 2. Phase 1 construction will take place during the first 26-month period, consisting of construction of the primary access routes, the construction laydown areas, the rough grading for the Main Services Complex and the substation sites, as well as the clearing areas disturbed by the construction of each solar group. Phase 2 will take place during construction months 32 through 60. Phase 2 will mostly involve construction of additional access roads and continued solar field development. (Ex. 300, p. C.7-17.)

The project site lies within the Lavic Valley Groundwater Basin. The basin is approximately 159 square miles in area and is bounded by nonwater-bearing rocks of the Cady Mountains on the north and east, the Bullion Mountains on the south and east, the Lava Bed Mountains on the southwest, and the Pisgah fault on the west. Parts of the eastern and northern boundaries are drainage divides. The southern part of this basin lies within the Twentynine Palms Marine Corps Base. (Ex. 300, p. C.7-11.)

In the northern part of the basin, which includes the project site, surface drainage is westward toward the Mojave River. In the southern part of the basin, surface drainage is toward Lavic (dry) Lake. (Ex. 300, p. C.7-11.)

The evidence indicates that groundwater flow at the project site appears to be to the southeast, but not toward Lavic (dry) Lake which is a surface water playa

above the regional water table. Rather, groundwater apparently flows eastward into the Broadwell Valley Basin near the (ghost) town of Ludlow. This interpretation is consistent with recharge modeling that indicates the largest source of recharge to the Lavic Valley Basin is rainfall infiltration in the Bullion Mountains that border the southern end of the basin. (Ex. 300, p. C.7-11.)

Precipitation supplies water to the basin, primarily by infiltration of mountain runoff across the alluvial deposits and through ephemeral washes. Recharge from precipitation on the valley floor is minimal. When runoff or precipitation does reach the dry lakes, infiltration to groundwater is negligible and most of the water is removed by evaporation. Groundwater discharge from the basin occurs mainly through pumping and underflow towards the Las Vegas Valley. (Ex. 300, p. C.7-11.)

Water from a well in the southern part of the basin near Lavic Lake sampled in 1917 was sodium sulfate in character with total dissolved solids (TDS) content of 1,680 milligrams per liter (mg/L). Water from a well in the northeastern part of the basin sampled in the 1950s was sodium sulfate in character with a TDS content of 1,721mg/L. Water from a well in the northwestern part of the basin near Hector Siding sampled in the 1950s was calcium-sodium bicarbonate in character with a TDS content of 278 mg/L. The Applicant proposes to use groundwater for project construction and operation obtained from Well #3, a new community well located on private property adjacent to the project site which has been deeded to the Applicant as of September 2010. Well #3 was originally drilled in March 2010 and analytical test results conducted on water samples collected from the well indicate groundwater contains 1,340 mg/L total dissolved solids. (Ex. 300, p. C.7-12; Ex. 114 , Attachment A 4.)

1. Storm Water

The project site is in the southwest portion of the Mojave Desert, which is characterized by broad alluvial fans and fluvial terraces, playas, and scattered mountains. There are no perennial streams within the project site or in the area. The site drains towards Troy (dry) Lake in the Mojave Valley, five miles west of the site. The proposed site occupies a broad alluvial fan/plain with relatively little topographic variation. (Ex. 300, p. C.7-12.)

The overall landform is relatively flat with shallow slopes trending from the north to south and in some areas to the southwest. The ground generally slopes in a northeast-to-southwest direction, ranging from two percent to five percent across

the site, except for the western portion where the slope reduces to one percent. Several drainage patterns occur on the site. The land between I-40 and the BNSF railroad slope to the west, ultimately towards Troy Dry Lake, a playa that is located west of the site. There are no well-defined channels on-site, although some discontinuous flood terraces occur in a few areas on-site. The drainage features on-site exhibit a mixed pattern of sheet flow or shallow concentrated flow across isolated, wide areas of land. Relatively undefined drainage features traverse most of the site with evenly distributed desert scrub vegetation throughout. (Ex. 300, pp. C.7-12 to C.7-13.)

In general, drainage in Phase 1 (including 1A & 1B) of the project area flows southwest from the Cady Mountains. However, along the southern boundary of Phase 1, some flows are diverted by the railroad and flow straight west (see **Soil and Water Figure 2** through **Soil and Water Figure 3** with the original project footprint overlay). As shown, there is an offsite watershed area of nearly 20 square miles which drains either directly to the Phase 1 project site or drains to the railroad tracks and is partially diverted into the Phase 1 site. The Phase 1 site is nearly 10 square miles, so the total watershed area for Phase 1 is approximately 30 square miles. Several blue line streams pass through the Phase 1 project area and all drain to the railroad at the southern boundary of the Phase 1 site. The runoff from the Phase 1 site flows through the existing trestles at the railroad. A 100-year flood will generally be conveyed along the railroad and through the trestles along the railroad right-of-way. This right-of-way is excavated and maintained by the BNSF Railroad Company to allow the water to pond and flow at low velocities. The right of way is delineated along the north line with a barbed wire fence. (Ex. 300, p. C.7-13.)

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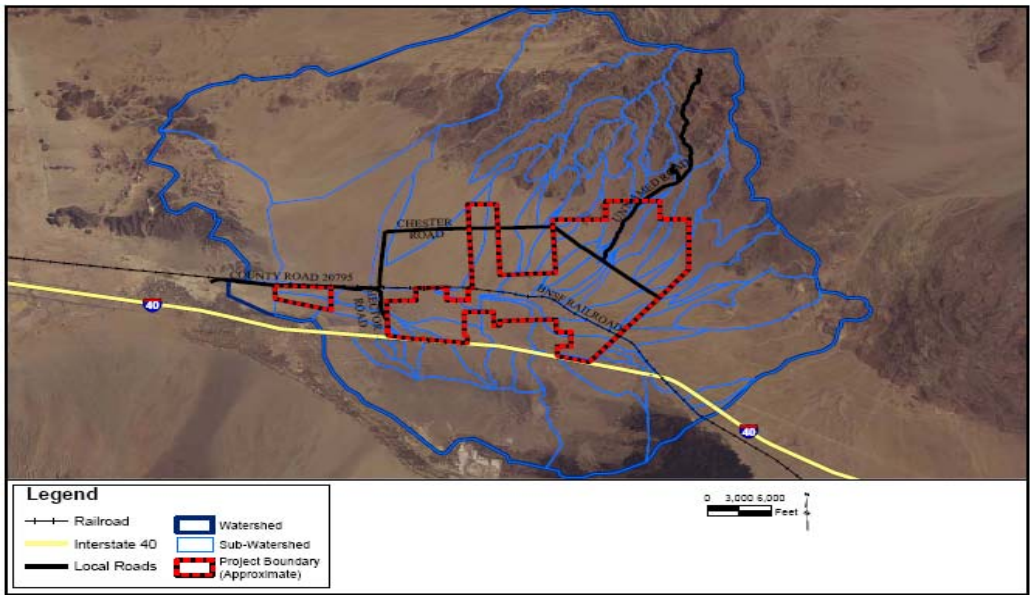
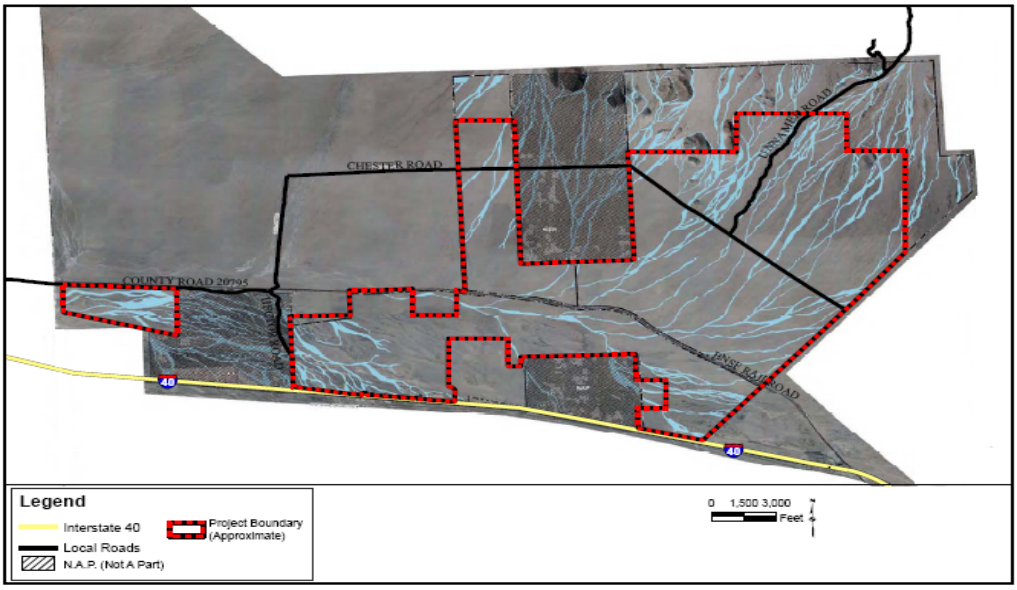
Soil and Water – Figure 2



Source: Exhibit 300

Soil and Water – Figure 3



Source: Exhibit 300

The offsite watershed impacting the Phase 1 site emanates from the Cady Mountains which flank the northeast side of the project area. Washes are often well incised near the base of the mountains. However, these same washes transition into sheet flow and shallow concentrated flow areas which do not have a well incised channel or a series of small channels which are braided, each of which may carry a fraction of the total flow. Sheet flow areas appear to be more

prevalent at distal locations from the apex of the fan. These locations are primarily within the proposed site development area. Because the sheet flow and braided wash flow may carry a sediment load and follow unpredictable flow paths, development within these areas could be impacted by the storm water. (Ex. 300, pp. C.7-13 to C.7-14.)

Flows that traverse the site emanate from the Cady Mountains watershed, drain through the trestles on the railroad and then continue west through the Phase 2 site. Upstream of the railroad trestles, the railroad embankment has diverted and channelized much of the flow creating numerous ponding areas. The trestles and ponding areas attenuate the peak flow and allow most of the sediment to drop out on the upstream (north or east) side of the railroad embankment. Additional drainage flows south from the Cady Mountains, west of the Phase 1 property limits, is diverted at the railroad tracks and then flows south in the Phase 2 area. In addition to the Cady Mountain watershed, a second watershed is located south of the freeway and includes the Pisgah Crater and lava flow area. Runoff from this watershed generally flows either north or west. It reaches I-40 and then continues north through numerous culverts and bridges into the Phase 2 project area. After flowing through the culverts at the highway, the runoff commingles with the flow from the Cady Mountains and then flows west to the outfall. As with the Cady Mountain watershed, the Pisgah watershed runoff is diverted by the I-40 road embankment and associated dikes and berms and is routed through culverts. Ponding occurs at these culvert locations and this reduces the peak flow and sediment loads which pass through the culverts. (Ex. 300, p. C.7-14.)

Storm water flows on the project site are considered “waters of the State” by the Lahontan Regional Water Quality Control Board and are subject to regulation under the Porter-Cologne Water Quality Control Act. As such, manipulation of the “waters” (i.e., area of flow) on the site and installation of project facilities within those areas would constitute “discharge of waste” subject to Waste Discharge Requirements (Ex. 300, pp. C.7-89 – C.7-121, (**Soil and Water Appendices B**, **C** and **D**). The U.S. Army Corps of Engineers has determined that no “waters of the U.S.” exist on the project so no federal wetland permitting is required. (Ex. 300, p. C.7-14.)

2. Soil and Erosion

Primarily two soil associations would be affected by project construction; the Carrizo-Rositas-Gunsight and the Nickel-Arizo-Bitter associations. The Carrizo-

Rositas-Gunsight soil association occupies the majority of the site, while the Nickel-Arizo-Bitter association is present over much of the southern portion of the site, south of the BNSF rail lines. The Rock Outcrop-Lithic Torriorthents-Calvista association is present in the mountains along the northern site perimeter and the Rock Outcrop-Upspring-Sparkhule association is present on the southwest corner of the project-site, as well as north and northwest of the site. The soil characteristics are contained in **Soil & Water Table 1**, below. (Ex. 300, p. C.7-15.)

Soil & Water Table 1
Summary of Soil Characteristics

Soil	Texture	Depth of Surface Layer (Inches)	Land Capability Class[1]	Wind Erodibility Group[2]	Erosion (K) Factor[3]	Natural Drainage Class[4]	Permeability in inches per hour[5]
Carrizo-Rositas-Gunsight	Loamy Fine Sand	9	7S	2	0.15	Somewhat Excessively Drained	6–20
Nickel-Arizo-Bitter	Gravelly Sandy Loam	7	7S	5	0.10	Well Drained	2–6
Rock Outcrop-Lithic Torriorthents-Calvista	Gravelly Loam	8	7E	8	0.20	Excessively Drained	2–6

Notes:

1 - Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat. Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

2 - Wind erodibility groups range from 1 to 8, with 1 being highly erodible and 8 having low erodibility.

3 - This is an index of erodibility for standard condition and includes susceptibility of soil to erosion and rate of runoff. Low K values (below 0.15) indicate low erosion potential. High K values (above 0.4) are highly erodible. See report text for additional information.

4 - Table presents nonirrigated land capability classification. Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Capability classes range from 1 to 8, with higher numbers indicating progressively greater limitations and narrower choices for use: Class 1 - slight limitations that restrict use; Class 2 - moderate limitations restricting choice of plants, or requiring moderate conservation practices; Class 3 - severe limitations restricting plant choice or requiring conservation; Class 4 - severe limitations, requiring very careful management; Class 5 - subject to little or no erosion, but mainly restricted use to pasture, rangeland, forestland, wildlife habitat; Class 6 - severe limitations, generally unsuitable for cultivation, restrictions per Class 5; Class 7 - severe limitations, unsuitable for cultivation, restrictions per Class 5. Capability subclasses: e - erosion is main hazard unless close-growing plant cover maintained; s - soil limited because shallow, droughty or stony; c - chief limitation is very cold or dry climate. Capability units (after '-') are soil groups within a subclass with similar suitability for crops and pasture plants with similar management requirements and productivity.

5 - Permeability refers to saturated hydraulic conductivity for the surface layer. Permeability rates listed are minimum and maximum expressed in inches/hr.

Source: (Ex. 300, p. C.7-14).

Vertical foundation elements (hollow metal pipes) for the SunCatchers will be inserted into the subsurface using track driven vibratory equipment. The vibratory insertion method eliminates conventional drilling techniques that would generate cuttings that typically require dust suppression for stockpiling, transferring, trucking and disposal of the cuttings. The track mounted equipment will also reduce ground disturbance (rutting) by spreading the load over a larger surface area. (Ex. 300, p. C.7-17.)

2. Project Water Supply

Groundwater is the primary water source available in the site vicinity. Groundwater occurrence and quality varies significantly within the Mojave Desert. The Applicant discovered a water bearing zone beneath the site that produced a volume and rate that is sufficient to supply both construction and operation water. The well boring was drilled in March 2010, to a depth of 1,147 feet below ground surface. Aquifer testing indicated the well is capable of producing at least 100 gpm over a 24-hour period without incurring excessive drawdown. Water samples collected from the well indicate that the groundwater contains a TDS concentration of 1,340 mg/L. The record indicates that the newly constructed well will provide all water needs for the project and no back-up supplies are proposed. (Ex. 300, p. C.7-17.)

Potable Water

The Applicant proposes to use treated groundwater for potable needs. The groundwater will first be demineralized, then stored in a designated storage facility equipped with chemical dosage for disinfection. This treated potable water will be available at the Main Services Complex. (Ex. 300, p. C.7-17.)

Construction Water

Water demands during construction of the project will be relatively light for a project of this size. Site construction will be accomplished in primarily two phases, Phase 1 (including both 1A & 1B) and Phase 2. Phase 1 construction will require less than 92,107,331 gallons or approximately 282.67 AF. Phase 2 will require less than 103,421,405 gallons or approximately 317.39 AF. The Applicant estimates that during the 60 months of project construction, the water demand for combined construction and dust suppression will be less than 600 AF. During construction, water use is expected to vary from approximately 3.108 million gallons (9.54 AF) per month (at the 18th month), to 4.046 million gallons (12.42 AF) per month (after the 34th month). (Ex. 300, pp. C.7-17 to C.7-18. Ex.

317, pp. C.7-8 to C.7-10.) Condition of Certification **SOIL&WATER-4** limits construction water use to 145 AFY.

Operations Water

Water use during electricity generation will be minimal due to the technology proposed for the Calico Project (Stirling engines). The raw site groundwater will require treatment to remove dissolved solids for SunCatcher mirror wash water applications and additional treatment to meet drinking water quality standards. Water treatment processes identified by the Applicant for demineralization are Reverse Osmosis (RO) and ion exchange. Potable water consumption, groundwater treatment, and SunCatcher mirror washing under average monthly maintenance routines will require less than 15.6 gpm of water per day. A maximum requirement of less than 41 gpm of water per day will be needed during the months when each SunCatcher receives a scrub wash. (Ex. 300, p. C.7-19. Ex. 317 p. C.7-10.) Condition **SOIL&WATER-4** limits operational water use to 21 AFY.

Water consumption during operation will be limited to mirror washing (10.3 AFY), water treatment (5.2 AFY), potable use (2.2 AFY), and dust control (2.5 AFY). Additionally, water will be used to generate hydrogen used in the SunCatcher engines. The record indicates that for Scenario 5.5, less than 205 gallons per day (0.23 AFY) of water will be required to produce a sufficient volume of hydrogen for power plant use. The evidence shows that the total maximum annual consumptive use of groundwater for operation of the reduced acreage power plant will be less than 20.4 AFY. (Ex. 300, pp. C.7-17 to C.7-18. Ex. 317 pp. C.7-10 to C.7-11.)

a. Wastewater

Sanitary Wastewater

Initially, control of sanitary waste will be accomplished using portable chemical toilets. No public or private entities manage sanitary wastewater in the vicinity of the project site. Therefore, construction of a permanent onsite wastewater disposal system consisting of a septic tank and leach field will be completed to handle sanitary wastewater. According to the evidence, a facility of this type will be designed to meet the requirements of the Lahontan RWQCB and the San Bernardino County Public Health Department, and will meet operation and maintenance guidelines required by the California Department of Public Health. (Ex. 300, pp. C.7-20 to C.7-21.) **SOIL&WATER-5** requires compliance with the

County of San Bernardino requirements for the construction and operation of the project's proposed sanitary waste septic system and leach field.

Construction Wastewater

Sources of wastewater will include equipment wash water and piping and vessel hydrostatic test water. Improper handling or containment of construction wastewater could cause a broad dispersion of contaminants to soil or groundwater. Discharge of any non-hazardous construction-generated wastewater will require compliance with discharge regulations. Equipment wash water would be transported to an appropriate treatment facility. Hydrostatic test water will be reused to the extent possible and, pending analytical results of the water, will be discharged to land or trucked offsite to an appropriate treatment and disposal facility. (Ex. 300, p. C.7-21.) **SOIL&WATER-2** requires compliance with Waste Discharge Requirements for any waste or storm water discharge by the project. In addition, **SOIL&WATER-10** will require the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) under the National Pollutant Discharge Elimination System (NPDES) program to protect storm water from accidental releases of wastes or other pollutants.

Process Wastewater

Extracted groundwater will require treatment to remove dissolved solids for SunCatcher mirror wash water applications and additional treatment will be required to meet current drinking water quality standards. The water will be demineralized to prevent mineral deposits forming on the SunCatcher mirrors. Treatment processes proposed to remove TDS include reverse osmosis (RO) and ion exchange. The wastewater generated by the RO unit will contain relatively high concentrations of TDS. The Applicant proposes to discharge the high TDS wastewater into two double-lined evaporation ponds. The wastewater discharge is expected to be classified as a "designated waste" and will comply with the requirements for Class II surface impoundments set forth in California Water Code section 13173. Each pond will be designed to contain one-year of discharge flow, estimated to total three million gallons. Discharge to the ponds will alternate on an annual basis, allowing one pond to undergo evaporation while the other receives the effluent. Treating the groundwater using demineralization equipment to attain a concentration suitable for mirror washing will create a waste water stream that will contain four to five times as much TDS as the source water, or approximately 5,500-7,000 mg/L. (Ex. 300, p. C.7-2.1.) **SOIL&WATER-2** requires the project owner to comply with the Waste Discharge Requirements regarding the design, construction and operation of the

impoundments and the monitoring and reporting associated with the operation of waste water evaporation ponds.

3. Impact Evaluation Criteria

To evaluate if significant environmental impacts to soil or water resources would occur, we apply the following criteria. Where a potentially significant impact is identified, we apply mitigation to reduce the potential impacts to less than significant levels.

- Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding or substantial erosion or siltation on or offsite?
- Would the project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?
- Would the project place structures within a 100-year flood hazard area which would impede or redirect flood flows?
- Would the project violate any water quality standards or waste discharge requirements?
- Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?
- Would the project contribute to any lowering of groundwater levels in the groundwater wells of other public or private water users?
- Would the project contribute to any lowering of the groundwater levels such that protected species or habitats are affected?
- Would the project cause substantial degradation to surface water or groundwater quality?

4. Construction Impacts and Mitigation

As proposed in reduced acreage Scenario 5.5, the project will be developed in two phases. Construction of Phase 1 is expected to take 26 months to complete and Phase 2 is expected to take 28 months. Construction will, therefore, occur over three or four winter seasons. Construction of the proposed project would include soil excavation, grading, installation of utility connections, installation of finned pole SunCatcher foundations, road building, paving, erection of structures and the use of groundwater. (Ex. 300, pp. C.7-21 to C.7-22.)

Groundwater use will primarily be for dust suppression, hydrostatic testing of the project's pressure vessels, moisture conditioning compacted soil and mixing concrete. Potential impacts to soils related to increased erosion or release of hazardous materials are possible during construction. Potential storm water impacts could result in an increase in flooding and sedimentation downstream if there is an increase in runoff flow rates and volume discharges from the site. Water quality could be impacted by discharge of hazardous materials released during construction. Project water demand could decrease the quantity of groundwater available. (Ex. 300, p. C.7-22.)

These construction activities can impact soil resources including increased wind and water-related soil erosion, soil compaction, loss of soil productivity, and disturbance of soils crucial for supporting vegetation and ephemeral water dependant habitats. Activities that expose and disturb the soil leave soil particles vulnerable to detachment by wind and water. Soil erosion results in the loss of topsoil and increased sediment deposition downstream. (Ex. 300, p. C.7-24.)

The magnitude, extent, and duration of those impacts depends on several factors, including the exposure of the soils to water and wind, the soil types affected, and the method, duration, and time of year of construction activities. Prolonged periods of precipitation or high intensity and short duration runoff events coupled with earth disturbance activities can result in accelerated on-site erosion. In addition, high winds during grading and excavation activities can result in wind borne erosion leading to increased particulate emissions that adversely impact air quality. The implementation of appropriate erosion control measures will help conserve soil resources, protect downstream properties and resources, and protect air quality. Conditions of Certification in the **Air Quality** section of this Decision provide mitigation that would prevent significant impacts from fugitive dust and soil erosion. Conditions of Certification **AQ-SC3** and **AQ-SC7** limit vehicle speed to 10 miles per hour during project construction and

require all unpaved roads and disturbed areas in the project and linear construction sites to be watered as frequently as necessary during grading and stabilized thereafter with a non-toxic soil stabilizer or soil weighting agent. Condition of Certification **AQ-SC4** and **BIO-8** establishes performance standards for controlling fugitive dust and requirements for additional effort should they be exceeded. The requirement to use soil weighting and bonding agents following grading would conserve freshwater by reducing the need for water as a means to control fugitive dust. (Ex. 300, p. C.7-24.) These techniques and erosion controls measures will also be reflected in the SWPPPs and the staff's Drainage, Erosion and Sediment Control Plan (DESCP) as required in the Conditions of Certification **SOIL&WATER 1, 2, 3, 8, 10 and 11**.

The evidence analyzed the potential impacts to soil resources, including the effects of construction activities that could result in erosion and downstream transportation of soils and the potential contamination of soils and groundwater. There are extensive regulatory programs in effect that are designed to prevent or minimize these types of impacts. These programs are effective, and absent unusual circumstances, an Applicant's ability to identify and implement program-approved Best Management Practices (BMPs) to prevent erosion or contamination is sufficient to ensure that these impacts will be less than significant. In addition, soils will be protected by the development and implementation of grading plans and a Drainage, Erosion and Sedimentation Control Plan (DESCP). The DESCP provides the plan for the use of BMPs to mitigate erosion and sedimentation impacts caused by site grading and other construction activities. (Ex. 300, pp. C.7-24 to C.7-25.)

The temporary erosion and sedimentation control measures to be used during construction will be designed to prevent sediment from being displaced and carried off-site by storm water runoff. Before beginning excavation activities, on-site debris basins, silt fence, straw bales, or other BMPs will be installed along the perimeter of the Project, where minor runoff to off-site areas could occur. On-site debris basins will be constructed for the major site runoff discharge and will also provide for low flow detention. The silt fences will filter sediments from construction runoff. Berms with culverts will be used at road crossings and other locations as needed to pass flows. During construction, the extent of earth disturbances will be minimized as much as is practical. A sediment trap will be constructed for the major site runoff discharge. The sediment trap will be located immediately upstream of the downstream property boundary. (Ex. 300, p. C.7-27.)

If necessary, as determined by the studies required by Condition of Certification **SOIL&WATER-8**, diversion swales with berms will be constructed to divert runoff from off-site areas and on-site undisturbed areas around the construction site. Temporary BMP control measures will be maintained during the rainy season throughout the construction period. Proposed erosion and sedimentation control measures include, but are not limited to: scheduling installation of BMPs to precede or coincide with construction activities; on-site debris and detention basins; preserving the existing vegetation to the extent possible; wetting or using soil binders or weighting agents in active construction and laydown areas; controlling speed on unpaved surfaces; placing gravel in entrance ways; and placement of straw bales, silt fences, and earthen berms. The Applicant will conduct a geomorphic and hydraulic analysis and other analyses to determine the maximum design storm that can be routed through the site and what drainage features must be incorporated into the project design to avoid adverse impacts to the railroad, roads or adjacent properties resulting from drainage and storm flows (**SOIL&WATER 8**). These analyses will be used in the development and implementation of a DESCP as required in Condition of Certification **SOIL&WATER-1** to ensure potential erosion and loss of soil is mitigated. In addition, Condition of Certification **SOIL&WATER-2** requires the compliance with waste discharge requirements for any waste or storm water discharges and **SOIL&WATER 10** requires the project owner to develop and implement a construction SWPPP and comply with the dredge and fill requirements developed by the Lahontan RWQCB. (Ex. 300, p. C.7-27; Ex. 317, pp. c.7-12 through C.7-15) The construction SWPPP and discharge controls will incorporate the findings and recommendations of the Condition of Certification **SOIL&WATER-8** analyses.

Due to the project's large scale, numerous physical variables exist that could affect the soil resources within the site boundaries. These variables are associated with various site conditions (erodibility) and potential environmental considerations (precipitation). In order to address possible outcomes given the various site conditions and possible environmental factors, the record contains mathematical calculations and probabilistic modeling to estimate anticipated potential impacts. While modeling and calculations can be used in an attempt to estimate future effects from a variety of environmental considerations, and they provide a basis for structural design parameters, these methods are based on assumptions and projections that are imprecise and untested in this environment. Should these assumptions and calculations be inaccurate, the consequences of flash flood damage or modified sedimentation and erosion rates could be significant. (Ex. 300, pp. C.7-27 to C.7-28.)

Condition of Certification **SOIL& WATER-3** will mitigate potential scour and flood impacts by requiring that all SunCatcher pole foundations will be designed to withstand storm water scour from surface erosion or channel migration based on the results of the **SOIL&WATER-8** analyses. **SOIL& WATER-3** will also require the project owner to develop a Storm Water Damage Monitoring and Response Plan to evaluate potential impacts from storm water, including pole foundations that fail due to storm water flow or otherwise break and scatter mirror debris and other SunCatcher components on to the ground surface. We find that implementation of Conditions of Certification **SOIL&WATER-1, -2**, **-3, -8 and -10** will mitigate potential impacts from construction activities to soils at the project site below significance.

Water used for construction of the Calico Solar Project will have a less than significant impact on the groundwater balance and the availability of groundwater to other basin users. The average annual water use during construction (150 AFY) is 38-75 percent of the estimated recharge to the Lavic Valley Basin (200 to 400 AFY), and average water use over the life of the project (31 AFY) is only six to 13 percent of the estimated recharge. The record shows that no other local users are known to rely on that recharge. The water use is less than one percent of the yield of the Lavic-Broadwell-Bristol Lake groundwater system, given the range of estimates of yield for the Bristol Lake Basin (5,000 AFY). (Ex. 300, p. C.7-31; Ex. 317, p. C.7-8 and C.7-10.) Condition of Certification **SOIL&WATER-4** limits water use to less than 145 AFY during construction and less than 21 AFY during operation and requires annual reporting of actual use to the Energy Commission. In addition, Condition of Certification **SOIL&WATER-7** requires continual groundwater monitoring and reporting by the Applicant.

The record further shows that project pumping will not affect groundwater levels or flow at that location so any impact to groundwater salinity, if any, is therefore less than significant. We find that construction impacts to groundwater levels will be mitigated below significance.

Improper handling or containment of construction waste water creates a potential risk that the material would percolate down to the water table and contaminate groundwater. The evaluation of impacts associated with hazardous materials indicated that liquid hazardous wastes present at the site would consist of fuels, solvents, cleaners, motor oil, lubricants and paints. The record shows that because of their small quantities and low mobility and/or toxicity, there is limited potential for off-site impacts. We find that potential on-site impacts are less than significant due to physical and administrative controls over the storage and use

of these materials imposed by measures **HAZ-1** through **HAZ-5** that provide for worker training, spill response, safety plans, site control and other measures that minimize the risk of a leak or spill capable of contaminating groundwater. (Ex. 300, p. C.7-35.) These controls will also be reflected in the measures implemented under **SOIL&WATER-2** and in the construction SWPPP required by **SOIL&WATER-10**.

Sources of waste water would also include equipment wash water and piping and vessel hydrostatic test water. Equipment wash water will be transported to an appropriate treatment facility. Hydrostatic test water will be reused to the extent possible and, pending analytical results of the water, will be discharged to land or trucked offsite to an appropriate treatment and disposal facility in accordance with the SWRCB Water Quality Order No. 2003-003-DWQ as a discharge to land with a low threat to groundwater and the requirements identified in **Soil and Water Appendices B**, **C**, **D** and **E** that are referenced in Condition of Certification **SOIL&WATER-2**. Compliance with these requirements will reduce the potential impacts from release of wastewater to less than significant levels. (Ex. 300, p. C.7-36.)

With the implementation of the mitigation measures described above, construction related impacts of the Calico Solar Project to erosion of soils; drainage of surface water, groundwater supplies and groundwater quality will not be significant.

5. Operational Impacts and Mitigation

The record analyzed impacts from the operation of the Calico Solar Project that could lead to accelerated soil erosion, increased storm water runoff, as well as potential water quality and water supply impacts. Soils may be potentially impacted through wind and water-related erosion or the release of hazardous materials used in the operation of the proposed project. Storm water runoff from the project could result in potential impacts if increased runoff flow rates and volumes discharged from the project increase erosion of the soil and increase downstream flooding. Water quality could be impacted by discharge of eroded sediments from the project or discharge of hazardous materials released during operation. Water supply used for dust suppression, SunCatcher mirror washing, and fire protection could lead to potential quantity or quality impacts to groundwater resources. (Ex. 300, p. C.7-36.)

The analysis of record considered the potential impacts to soil resources caused by operation of the facility that could result in erosion and downstream transportation of soils and the potential contamination of soils and groundwater. There are extensive regulatory programs in effect (NPDES, SWPPP, NRCS) that are designed to prevent or minimize these types of impacts. These programs are effective, and absent unusual circumstances, an applicant's ability to identify and implement program-approved BMPs to prevent erosion or contamination is sufficient to ensure that these impacts will be less than significant. The requirements of these programs are reflected in Condition of Certification **SOIL&WATER-11**. In addition, soils would be protected by the development and implementation of the DESCP required in **SOIL&WATER-1**. (Ex. 300, pp. C.7-36 to C.7-37.)

The proposed project will be located on a series of undeveloped alluvial fans. Construction of the proposed project will change natural drainages, remove some natural vegetation and soil structure, and add impervious areas to the site, all of which could cause an increase in storm water runoff. (Ex. 300, p. C.7-37.)

Storm water flow volume and velocity is affected by several parameters, such as surface infiltration rates and the roughness of the flow surface. Construction, operation, and decommissioning of the proposed project may modify the infiltration rate through several processes, including earthmoving, compaction, and use of dust suppressants. (Ex. 300, p. C.7-37.)

Water quality could also be impacted if the storm water drainage pattern concentrates runoff in areas that are not properly designed or protected with BMPs or causes increased erosion and sediment discharge offsite. Project components that could alter or concentrate existing drainage patterns could include the installation of linear fences, access roads, buildings, SunCatchers, and associated infrastructure. (Ex. 300, pp. C.7-37 to C.7-38.)

With concentrated flows, scour may transport sediment long distances. Scour may occur under sheet flow conditions due to water depths, velocities, and soil parameters. Scour of existing or future channelized flow paths can meander and move during large flow events, which is common on alluvial fans. The proposed reduced acreage Scenario 5.5 includes a total of 26,540SunCatchers supported by a single metal fin-pipe foundation hydraulically driven into the ground. Migration of channels and local scour caused by storm water flows could remove sediment supporting individual poles and cause them to fall to the ground. Once on the ground during a storm event, the broken glass associated with the mirrors

could further break and be transported downstream. Also, the SunCatchers structure itself and the associated wiring and piping, could be transported downstream. Although the security fence located on the downstream side of the proposed project area could stop larger pieces from leaving the property, it would not stop small glass fragments. Also, the fence itself could be threatened by storm water flows and could not guarantee the onsite capture of all damaged materials. (Ex. 300, p. C.7-37; Ex. 317 p. B.1-2.)

The record establishes that the effects of wind and water-related erosion and storm water flow onto and off the proposed project will be mitigated through implementation of Conditions of Certification **SOIL&WATER-1**, **-2**, **-3, -8 and -11**. **SOIL&WATER-1** requires the project Applicant to develop a DESCP to ensure protection of water quality and soil resources. **SOIL&WATER-2** requires the Applicant to develop an Industrial SWPPP that meets the requirements for discharges of storm water. Condition of Certification **SOIL&WATER-3** requires the Applicant to develop a Storm Water Damage Monitoring and Response Plan to monitor the SunCatchers and mitigate potential impacts from SunCatchers damaged during storm events. **SOIL&WATER 11** requires the Applicant to comply with the RWQCB requirements for operational stormwater protection. All of these plans and designs will be based on the results of analyses required by Condition of Certification **SOIL&WATER-8** and maintained over the life of the project. We find that Conditions of Certification **SOIL&WATER-1, -2**, **-3, -8 and 11** mitigate these potential stormwater flow impacts below significance. (Ex. 300, p. C.7-39; Ex. 317 p. C.7-12 through C.7.15.)

Intervenor, BNSF devoted substantial time developing a record to suggest the need to include drainage basins in the design and implementation of stormwater protection BMPs. (9/20/10 RT 73-326). Although the testimony varied on the necessity for drainage basins at the site, the parties agreed that the determination of the need for drainage basins would benefit from a hydrologic study. (Id.) **SOIL&WATER-12** requires the Applicant to fund a hydrologic study commissioned by BNSF to determine the erosion and sedimentation impact, if any, on BNSF infrastructure resulting from the project's planned emplacement of SunCatchers, flood control structures and runoff control measures. (9/20/10 RT 73:24-75:13).

The project's operational water demand is estimated to be approximately 20.4 AFY. The Applicant has proposed to pump groundwater from Well #3, a well located on private land adjacent to the project site. The water will be pumped from the well, conveyed in an underground pipe to a water storage tank, treated and dispersed for on-site use. (Ex. 300, p. C.7-39.)

Sanitary wastewater from buildings on the site will be disposed of by means of an on-site septic system and leach field. Reject brine from the demineralization facility will be discharged to two on-site ponds for evaporation. (Ex. 300, p. C.7-39.)

As described above under "Construction Impacts and Mitigation," the impact of the project on groundwater levels will be negligible and the impact less than significant from project construction as well as operation. Condition of Certification **SOIL&WATER-4** will ensure the project supply will be limited to the maximum needed for project construction and operation. To ensure the well can provide an adequate water supply, the project owner will be required to comply with Condition of Certification **SOIL&WATER-9** that requires a Water Conservation and Alternative Water Supply Plan, should groundwater monitoring indicate long-term downward trends in water levels and storage. (Ex. 300, p. C.7-40.)

Although there are no known existing groundwater users near enough to the project site to be substantially affected by project pumping, hydrogeologic conditions are uncertain. The evidence shows that the Pisgah Fault likely prevents drawdown from extending into the Lower Mojave River Basin and any overdraft effects in the Lower Mojave River Basin from extending into the Lavic Lake Basin. To confirm these findings, Condition of Certification **SOIL&WATER-7** will require the Applicant to comply with the County of San Bernardino's Desert Groundwater Management Ordinance and implement a monitoring plan that would characterize baseline water levels in the project vicinity, characterize aquifer materials, integrate water level measurement with any existing monitoring network, and provide for analysis of the project effects on water levels in the area. The Applicant will monitor static water levels quarterly in the project water supply well and select dedicated wells located on either side of the Pisgah Fault. The data will be made available to San Bernardino County and agencies responsible for regional water level monitoring (i.e., DWR and USGS). If monitoring data indicate downward trends in water levels and groundwater water storage, Condition of Certification **SOIL&WATER-9** requires the project owner develop and implement a Water Conservation and Alternative Water Supply Plan to mitigate impacts. (Ex. 300, p. C.7-40.)

Project operation will produce three wastewater streams that are potential sources of groundwater contamination: reject brine from the RO/demineralization

facility, utility water used for equipment washing and maintenance, and septic system leachate from domestic water use. (Ex. 300, pp. C.7-40 to C.7-41.)

During project operation, septic system percolation will amount to approximately 2.2 AFY, which is the amount of water used for domestic purposes. The unsaturated zone above the water table is 344 feet thick at the project site (the depth to water in Well #3). Percolation through the unsaturated zone will certainly remove any pathogens in the waste water and will likely allow substantial denitrification. Domestic water use normally contributes approximately 200 mg/L of total dissolved solids to waste water. The TDS concentration of domestic water will be at least partially demineralized to meet the secondary drinking water standard of 1,000 mg/L. The TDS concentration of sanitary waste water would therefore be around 1,200 mg/L, or comparable to the local TDS concentration in the aquifer (1,340 mg/L at Well #3). Therefore, the septic leachate will not increase groundwater salinity. Further, the septic system will meet the permitting requirements of the San Bernardino County Department of Public Health as required in **SOIL&WATER-5**. All of these factors support our conclusion that the impact of the septic system on groundwater quality will be less than significant. (Ex. 300, p. C.7-41.)

The Applicant proposes to discharge the waste water to one of two concrete-lined evaporation ponds. Each pond will be sized to contain one year of discharge flow or approximately three million gallons. A minimum of one year is expected to be required for the waste water to undergo the evaporation process. After the first year, the second pond will receive all treatment waste water while the first pond is undergoing evaporation. The two ponds will alternate their functions on an annual basis. After the brine has gone through the evaporation process, the solids that settle at the bottom of the evaporation pond will be tested by the Applicant and disposed of in an appropriate non-hazardous waste disposal facility. The solids will be scheduled for removal during the dry summer months. As indicated by the Lahontan Regional Water Quality Control Board (see **Soil and Water Appendices B**, **C**, **D** and **E**), the Applicant has not provided information necessary to complete development of requirements for discharges of brine waters to evaporation ponds or sanitary septic systems. This information is needed to ensure that the ponds will be designed, constructed and operated to prevent concentrated brine leaking and reaching the water table. However, the requirements for the design, construction and operation of evaporation pond as well as the restrictions on the waste water are very specific. The use of these types of surface disposal facilities is well documented and is prevalent in power plant siting cases. Impacts associated with the construction and operation of

these disposal facilities are routinely mitigated. As a result, we find that impacts will be mitigated to less than significant with the implementation of Condition of Certification **SOIL&WATER-2** which requires the project owner to comply with the Waste Discharge Requirements regarding the design, construction and operation of the impoundments as well as the monitoring and reporting associated with the operation of waste water evaporation ponds. (Ex. 300, p. C.7-41.)

Maintenance of the Power Conversion Units (PCU) and other mechanical devices (e.g., drive repair) will be performed in onsite service stations. These service stations consist of modular, containerized work stations to perform equipment prewash and inspection, disassembly/reassembly, parts storage, end of service inspection, etc. The prewash and inspection station will include heated, pressurized water spray to clean engine components before maintenance performance. Expected waste water production is 15 gallons per wash (3 gpm sprayer for five minutes). The waste water generated will be captured in the service station and diverted to containers (e.g., drums) for offsite recycling by third party providers. Prior to disassembly of engines, the fluids will be drained and captured for recycling. These engine fluids will be captured, aggregated in containers (e.g., drums) and recycled by third party providers. Collection and recycling of this waste water will be managed in accordance with Conditions of Certification **WASTE-7** and -**8**. (Ex. 300, p. C.7-42.)

There will be no significant wastewater related impacts to water or soil during operations if the project owner complies with proposed Conditions of Certification **SOIL&WATER-2** and -**5**. **SOIL&WATER-2** establishes the requirements for waste and storm water discharges and **SOIL&WATER-5** establishes the requirements for the installation of the proposed septic tank and leach field. (Ex. 300, p. C.7-42.)

6. Cumulative Impacts and Mitigation

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (California Code Regulation, Title 14, section 15130). NEPA states that cumulative effects could result from individually minor but collectively significant actions taking place over a period of

time (40 CFR §1508.7). There is the potential for future development in the Lavic Valley area and throughout the southern Mojave Desert region. Cumulative impacts can occur if implementation of the proposed project could combine with those of other local or regional projects. The locations of existing and reasonably foreseeable developments in the Lavic Valley area are presented in **Soil & Water Table 2 and 3.** (Ex. 300, p. C.7-56.)

Soil & Water Table 2

Existing Projects in the Newberry Springs/Ludlow Area

ID	Project Name	Location	Agency/ Owner	Status	Project Description
1	Twentynine Palms Marine Corps Air Ground Combat Center (MCAGCC)	Morongo Basin (to the south of project site)	U.S. Marine Corps	Existing	The Marine Corps' service-level facility for Marine Air Ground Task Force training. It covers 596,000 acres to the south of the Calico Solar Project site and north of the city of Twentynine Palms
2	SEGS I and II	Near Daggett (17 miles west of project site)	Sunray Energy, Inc.	Existing	Solar parabolic trough facilities generating 13.8 MW and 30 MW, respectively.
3	CACTUS (formerly Solar One and Solar Two)	Near Daggett (to the west of project site)	University of California Davis	Existing	A non-working 10 MW solar power tower plant converted by UC Davis into an Air Cherenkov Telescope to measure gamma rays hitting the atmosphere. The site is comprised of 144 heliostats. This project had its last observational run in 2005. SCE has requested funds from the California Public Utilities Commission to decommission the Solar Two project. (UC Davis 2009)
4	Mine	2 miles west of project site along I-40		Existing	Small-scale aggregate operation (AFC p. 5.3-12)
5	Mine	14 miles west of project site along I-40		Existing	Larger aggregate mining operation that produced less than 500,000 tons per year in 2005 (AFC p. 5.3-12)

Source: Ex. 300, p. B.3-9.

Soil & Water Table 3
Future Foreseeable Projects in the Newberry Springs/Ludlow Area

ID	Project Name	Location	Agency/ Owner	Status	Project Description
A	SES Solar Three (CACA 47702)	T's. 8, 9N., R5E (Immediately west of project site)	SES Solar Three, LLC	BLM received completed amended application June 2007. SES withdrew the application for Solar Three in December 2009. As there was a second-in-line application, this application becomes the project proposed at this location. .	914 MW Stirling solar plant on 6,779-acre site.
B	Broadwell BrightSource (CACA 48875)	Broadwell Valley (T'8N and 9N; R7E) – in northeast direction of project site	Bright-Source Energy, Inc.	Application filed with BLM. Potential conflict with proposed National Monument. Plans withdrawn/put on hold in September 2009.	5,130-acre solar thermal facility using power tower technology.
C	SCE Pisgah Substation expansion	Immediately southeast of project site	Southern California Edison		Substation upgrade from 220-kV to 500-kV

ID	Project Name	Location	Agency/ Owner	Status	Project Description
D	Pisgah-Lugo transmission upgrade	Pisgah Substation (SE side of project site) to Lugo Substation (near Hesperia)	Southern California Edison		The proposed 850 MW Calico Solar Project would require removal of 65 miles of existing 220-kV transmission line and reinstallation with a 500-kV line. The Reduced Acreage Alternative (275 MW) would require an upgrade of the telecommunication facilities serving the existing 200-kV Pisgah-Lugo transmission line. Specifically, it would require: • Replacement of a portion of existing Eldorado-Lugo 500 kV overhead ground wire with new optical ground wire between the Lugo and Pisgah Substations • Installation of a new fiber-optic line between the Pisgah Substation and Cool Water Substation (new fiber to be installed on approximately 20 miles of existing electric distribution poles).
E	Twentynine Palms Expansion	Morongo Basin (south of project site)	U.S. Marine Corps	NOI to prepare EIS to study alternatives published in Oct. 2009. Draft EIS expected September 2010.	400,000-acre expansion on the east, west, and south of the existing 596,000-acre Twentynine Palms Marine Corps base. In June 2009, approximately 60,000 acres in all study areas were removed from further study, leaving 360,000 acres under study (USMC 2009).

ID	Project Name	Location	Agency/ Owner	Status	Project Description
F	Solel, Inc. (CACA 049424)	Southwest of proposed site, immediately north of Twentynine Palms MCAGCC	Solel, Inc.	BLM received application in July 2007, POD is under review.	600 MW solar thermal plant proposed on 7,453 acres.
G	Wind project (CACA 48629)	Black Lava T2N, R5E, T1N, R5E	Oak Creek Energy	BLM received application December 2006. Issues with partial location in ACEC.	Wind project on 17,920 acres
H	Wind Project (CACA 48667)	South Ludlow T6N/R6E, T7N/R6E, T6N/R7E, T7N/R7E, T6N/R8E, T7N/R8E (In southeast direction of project site)	Oak Creek Energy	Pending	Wind project on 25,600 acres
I	Wind project (CACA 48472)	Troy Lake T9N&10N, R4E (In west direction of project site)	Power Partners SW (enXco)	Pending review of EA.	Wind project on 10,240 acres
J	Twin Mountain Rock Venture	10 miles west of Ludlow and 1 mile south of I-40; APN 0552-011-10-0000	Rinker Materials	Permit granted to extend permit to 2018	Plan to re-permit a cinder quarry on approximately 72 acres of leased land. No development activity has occurred on project site.
K	Solar thermal (CACA 49429)	Stedman (in southeast direction of project site)	Solel, Inc.	Application filed with BLM.	600 MW solar project on 14,080 acres. POD under review.

ID	Project Name	Location	Agency/ Owner	Status	Project Description
L	Proposed National Monument (former Catellus Lands)	Between Joshua Tree National Park and Mojave National Preserve		In December 2009, Sen. Feinstein introduced bill S.2921 that would designate 2 new national monuments including the Mojave Trails National Monument.	The proposed Mojave Trails National Monument would protect approximately 941,000 acres of federal land, including approximately 266,000 acres of the former railroad lands along historic Route 66. The BLM would be given the authority to conserve the monument lands and also to maintain existing recreational uses, including hunting, vehicular travel on open roads and trails, camping, horseback riding and rockhounding.
M	BLM Renewable Energy Study Areas	Along the I-10 corridor between Desert Center and Blythe	BLM	Proposed, under environmental review	The DOE and BLM identified 24 tracts of land as Solar Energy Study Areas in the BLM and DOE Solar PEIS. These areas have been identified for in-depth study of solar development and may be found appropriate for designation as solar energy zones in the future.

Source: Ex. 300, pp. B.3-10 through B.3-13Cumulative Impacts to Soiland Storm Water

Construction and operation of the Calico Solar Project will result in both temporary and permanent changes to the soil and storm water drainage patterns at the project site. Without the use of BMPs determined by the results of analyses required by Condition of Certification **SOIL&WATER-8** that would be incorporated into a final DESCP and construction SWPPP, these changes could incrementally increase local soil erosion and storm water runoff. However, as discussed above, these potential impacts would be prevented or reduced to a level of less than significant through the implementation of BMPs, a final DESCP, and construction SWPPP, and compliance with all applicable erosion and storm water management LORS. Similarly, compliance with these LORS and

SOIL&WATER-1, -**2** and -**3**, would ensure that the Calico Solar Project's contribution to cumulative impacts would not be cumulatively considerable. (Ex. 300, p. C.7-60; Ex. 317 C.7-12 through C.7-15.)

Cumulative Impacts to the Basin Balance

As discussed above, during construction and operation of the Calico Solar Project, the groundwater demand would average less than 150 AFY during construction and less than 20.4 AFY during operation. Because of subsurface flow between basins, the groundwater system that would be affected by groundwater pumping for the project includes the Lavic Valley, Broadwell Valley and Bristol Lake Basins. Six projects listed in **Soil and Water Table 2 and 3** would be located within that area and would consume groundwater. These include a reactivated cinder quarry and an expansion of the Twentynine Palms Marine Corps base. The water requirements for those projects are not known. The remaining four projects are solar power projects. Two of those projects would be dry cooled and have small water requirements similar to those of the Calico Solar Project: the Stirling Energy Systems Solar Three Project (application withdrawn but replaced by another renewable energy project ROW application with the BLM) adjacent to the west boundary of the Calico Solar Project and the Bright Source (power tower) project in the Broadwell Valley. The remaining two proposed solar power projects appear to use solar trough technology, but the proposed method of cooling is unclear. If the projects use wet cooling, groundwater consumption per megawatt-hour of energy production would be on the order of 10 times larger than dry-cooled plants such as the Calico Solar Project. (Ex. 300, p. C.7-60 to C.7-61; Ex. 317 C.7-8 and C.7-10.)

The record indicates that wet-cooling of parabolic trough solar power plants requires an average of 930 gallons of water per megawatt-hour of electricity generated. A wet-cooled parabolic trough plant the size of the Calico Solar Project (850 MW) operating 2,500 hours per year would consume 6,000 AFY of water, or 300 times more than the Calico Solar Project. Dry-cooled parabolic trough plants typically consume 80 gallons per megawatt-hour of energy produced, which is still 30 times larger than water use for the Calico Solar Project. From the standpoint of efficient use of scarce water resources, the incremental impact of the Calico Solar Project groundwater use is minute compared to the potential impact of any wet-cooled projects. (Ex. 300, p. C.7-61.)

If all four of the other solar projects are as water-efficient as the Calico Solar Project, their combined consumptive use of groundwater (approximately 100 AFY

during operation) would be small compared to total groundwater recharge to the Lavic-Broadwell-Bristol Lake groundwater system. For example, groundwater consumption for those projects is 25- to 50-percent of the recharge in just the Lavic Lake Basin, and therefore probably insignificant relative to the entire Lavic-Broadwell-Bristol Lake groundwater system which receives substantially more than 200 to 400 acre-feet per year of recharge. Nevertheless, even in the absence of more evidence, we conclude that the Calico Project's negligible contribution to cumulative impacts to the groundwater basin will not be cumulatively considerable.

Cumulative Impacts to Wells

The cumulative impact on groundwater levels caused by groundwater pumping to supply the four additional solar projects in the Lavic-Broadwell-Bristol Lake basin area depends on the type of technology and cooling method selected for those plants. If all four were as water-efficient as the Calico Solar Project, water level declines at Bristol Lake and nearby wells would be less than one inch. A single wet-cooled plant with a generating capacity as large as the Calico Solar Project (850 MW) would more than double estimated groundwater pumping from the three basins and potentially cause significant impacts. Nevertheless, we still find that the Calico Project' contribution to cumulative impacts to the groundwater basin will not be cumulatively considerable.

7. Compliance with LORS

<u>Clean Water Act</u>

The proposed project would satisfy the requirements of the RWQCB with the adoption of the following Conditions of Certification:

1) Development of the DESCP in accordance with **SOIL&WATER-1**;

2) Development of a Storm Water Damage Monitoring and Response Plan in accordance with **SOIL&WATER-3**,

3) Compliance with wastewater discharge requirements in accordance with **SOIL&WATER-2** and as specified in **Soil & Water Appendix B, C**, and **D**. In addition, the Applicant would be required to comply with California Department of Fish and Game's Streambed Alteration Agreement requirements in accordance with Condition of Certification **BIO-27**.

4) Compliance with storm water protection in accordance with **SOIL&WATER-10 and 11**.

Public Resources Code, Sections 25300 through 25302

Through compliance with Conditions of Certification **SOIL&WATER-4**, information required by Staff to conduct assessments and forecasts of potable and industrial water consumption by power plants is achieved. The Commission also promotes "all feasible means" of water conservation and "all feasible uses" of alternative water supply sources (*Section 25008*).

California Water Code Section 6000 to 6004.5 and 6025.5

Through compliance with **SOIL&WATER-8** and **GEO-2** and -**3**, information required by Staff to analyze the Applicant's compliance with these sections is achieved. The Applicant will provide information that the debris basins are in compliance with the State of California Department of Water Resources, Division of Safety of Dams (DOSD).

California Code of Regulations, Title 23, Division 2, Chapter 1, Article 303

Through compliance with **SOIL&WATER-8** and **GEO-2** and -**3**, information required by Staff to analyze the Applicant's compliance with this regulation is achieved. If necessary, Applicant will provide evidence that the developer has appropriate water rights before an application for the construction or enlargement of a DOSD Jurisdictional dam can be approved.

Energy Commission Policy

Sources of Policy

The Energy Commission has four sources for statements of policy relating to water use in California applicable to power plants. They are the California Constitution, the Warren-Alquist Act, the Commission's restatement of the state's water policy in the 2003 Integrated Energy Policy Report ("IEPR") and the State Water Resources Control Board ("SWRCB" or "Board") resolutions (in particular Resolutions 75-58 and 88-63).

California Constitution

California's interest in conserving water is so important to our thirsty state that in 1928, the common law doctrine of reasonable use became part of the state Constitution. Article X, Section 2 calls for water to be put to beneficial use, and that "waste or unreasonable use or unreasonable *method of use* be prevented." (Cal. Const., art. X, § 2; emphasis added.) The article also limits water rights to reasonable use, including reasonable methods of use. (*Ibid*.) Even earlier in the 20th Century, a state Supreme Court case firmly established that groundwater is subject to reasonable use. (*Katz v. Walkinshaw* (1903) 141 Cal. 116.) Thus, as modern technology has made dry-cooling of power plants feasible, the

Commission may regard wet-cooling as an unreasonable method of use of surface or groundwater, and even as a wasteful use of the state's most precious resource.

Warren-Alquist Act

Section 25008 of the Commission's enabling statutes echoes the Constitutional concern, by promoting "all feasible means" of water conservation and "all feasible uses" of alternative water supply sources. (Pub. Res. Code § 25008.)

Integrated Energy Policy Report

In the 2003 Integrated Energy Policy Report ("IEPR" or "Report"), the Commission reiterated certain principles from SWRCB's Resolution 75-58, discussed below, and clarified how they would be used to discourage use of fresh water for cooling power plants under the Commission's jurisdiction. The Report states that the Commission will approve the use of fresh water for cooling purposes only where alternative water supply sources or alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound." (IEPR (2003), p. 41.) In the Report, the Commission interpreted "environmentally undesirable" as equivalent to a "significant adverse environmental impact" under CEQA, and "economically unsound" as meaning "economically or otherwise infeasible," also under CEQA. (IEPR, p. 41.) CEQA and the Commission's siting regulations define feasible as "capable of being accomplished in a successful manner within a reasonable amount of time," taking into account economic and other factors. (Cal. Code Regs., tit. 14, § 15364; tit. 20, § 1702, subd. (f).) At the time of publication in 2003, dry cooling was already feasible for three projects - two in operation and one just permitted. (IEPR, p. 39.)

The Report also notes California's exploding population, estimated to reach more than 47 million by 2020, a population that will continue to use "increasing quantities of fresh water at rates that cannot be sustained." (IEPR, p. 39.)

State Water Resources Control Board Resolutions

The SWRCB not only considers quantity of water in its resolutions, but also the quality of water. In 1975, the Board adopted the *Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling* (Resolution 75-58). In it, the Board encourages the use of wastewater for power plant cooling. It also determined that water with a TDS concentration of 1,000 mg/L or less should be considered fresh water (Resolution 75-58). One express purpose of that Resolution was to "keep the consumptive use of fresh water for power

plant cooling to that *minimally essential*" for the welfare of the state (*Ibid*; emphasis added).

In 1988, the Board determined that water with TDS concentrations of 3,000 mg/L or less should be protected for and considered as potential supplies for municipal or domestic use unless otherwise designated by one of the Regional Water Quality Control Boards (Resolution 88-63.)

San Bernardino County Ordinance 3872 (Code Title 3, Division 3, Chapter 6, Article 5)

To help protect groundwater resources in San Bernardino County, the County enacted Ordinance 3872. This ordinance requires a permit to locate, construct, operate, or maintain a new groundwater well within the unincorporated, unadjudicated desert region of San Bernardino County. CEQA compliance must also be completed prior to issuance of a permit. The article does not apply to "groundwater wells located on Federal lands unless otherwise specified by inter-agency agreement." The BLM and County entered into a MOU that provides that the BLM will require conformance with Article 5 for all projects proposing to use groundwater from beneath public lands. The MOU provides that the County and BLM will work cooperatively together to ensure conformance with applicable LORS by project developers on BLM land. As part of meeting the requirements of the County's permitting process, the County may require the project owner to prepare a groundwater monitoring plan in accordance with the County's "*Guidelines for Preparation of a Groundwater Monitoring Plan*" dated January 1998. Condition of Certification **SOIL&WATER-7** will require the project owner to ensure that all onsite groundwater wells would be installed in accordance with the County of San Bernardino requirements and to submit a well construction packet to the County for comment and written evaluation. The project owner would also be required to submit well completion reports to the DWR in accordance with the DWR well completion reporting requirements.

8. Public Comment

No public comment was received regarding the Calico Project effect on soil and water resources.

FINDINGS OF FACT

1. The Calico site (Scenario 5.5) will contain approximately 26,540SunCatchers and associated equipment and infrastructure within a fenced boundary.

2. No “waters of the U.S.” exist on the project so no federal wetland permitting is required.

3. The newly constructed Well #3 adjacent to the project site will provide all water needs for the project.

4. Phase 1 construction will require less than 92,107,331 gallons or less than 282.67 AF.

5. Phase 2 will require less than 103,421,405 gallons or less than 317.39 AF.

6. During the 60 months of project construction, the water demand for combined construction and dust suppression will be less than 600 AF.

7. Condition of Certification **SOIL&WATER-4** limits construction water use to 145 AFY.

8. Water consumption during operation will be limited to mirror washing (10.3 AFY), water treatment (5.2 AFY), potable use (2.2 AFY), dust control (2.5 AFY) and hydrogen generation (0.23 AFY).

9. The total maximum annual consumptive use of groundwater for operation of the power plant will be less than 20.4 AFY.

10. Condition **SOIL&WATER-4** limits operational water use to 21 AFY.

11. Compliance with Condition of Certification **SOIL&WATER-5**, will mitigate any potential impacts from the operation of sanitary waste septic system and leach field to a less than significant level.

12. The BMPs identified in the record and required by the Conditions of Certification will avoid significant soil erosion and subsequent sedimentation during construction.

13. Conditions of Certification in the **Air Quality** section of this Decision provide mitigation that would prevent significant impacts from fugitive dust and soil erosion.

14. Adherence to the procedures and restrictions of the Waste Discharge Requirements required by Condition **SOIL&WATER-2,** the DESCP required by Condition **SOIL&WATER-1** and compliances with the requirements of the NPDES program required by **SOIL&WATER-10 and -11** will conserve soil resources, maintain water quality, prevent accelerated soil loss, and protect air quality.

15. Conditions of Certification **SOIL&WATER-1, -2**, **-3, -8,-10 and 11** will mitigate potential impacts to soils at the project site below significance.

16. Water used for construction and operation of the Calico Solar Project will have a less than significant impact on the groundwater balance and the availability of groundwater to other basin users.

17. Calico Solar Project pumping will not affect groundwater levels or flow so any impact to groundwater salinity, if any, is therefore less than significant.

18. Potential on-site impacts from the risk of a leak or spill of hazardous materials contaminating groundwater are less than significant due to physical and administrative controls over the storage and use of these materials imposed by measures **HAZ-1** through **HAZ-5**.

19. Compliance with the requirements identified in **Soil and Water Appendices B**, **C**, **D** and **E** that are referenced in Condition of Certification **SOIL&WATER-2** will reduce the potential impacts from release of wastewater to less than significant levels.

20. The SWPPP and DESCP required by Condition **SOIL&WATER-1** through Condition **SOIL&WATER-3** and **SOIL&WATER-8, 10 and 11** which establish methods to control and manage storm water flow ensure that construction and operational impacts of the Calico Solar Project to erosion of soils, drainage of surface water, groundwater supplies and groundwater quality will not be significant.

21. Wastewater will be processed and disposed of according to standards, required by Condition **SOIL&WATER-2 and -5**, that will protect surface waters and ground water.

22. Condition of Certification **SOIL&WATER-7** requires the project owner to comply with the County of San Bernardino's Desert Groundwater Management Ordinance and implement a monitoring plan that will characterize baseline water levels in the project vicinity, characterize aquifer materials, integrate water level measurement with any existing monitoring network, and provide analysis of the project's effects on water levels in the area.

23. If monitoring data indicate downward trends in water levels and groundwater water storage, Condition of Certification **SOIL&WATER-9** requires the project owner develop and implement a Water Conservation and Alternative Water Supply Plan to mitigate impacts.

24. **SOIL&WATER-5** ensures that the impact of the septic system on groundwater quality will be less than significant as the septic system must meet the permitting requirements of the San Bernardino County Department of Public Health.

25. Calico Solar Project will annually alternate discharging waste water into one of two concrete-lined evaporation ponds sized to contain one year of discharge flow or approximately three million gallons.

26. Implementation of Condition of Certification **SOIL&WATER-2** which requires the project owner to comply with the Waste Discharge Requirements, including monitoring and reporting associated with the operation of waste water evaporation ponds, will mitigate impacts attributable to the evaporation ponds to less than significant.

27. The Calico Solar Project's contribution to cumulative impacts to soil and water resources will not be cumulatively considerable.

CONCLUSIONS OF LAW

With implementation of the Conditions of Certification as set forth herein, the Calico Solar Project will comply with all applicable LORS, and will not result in any unmitigated and significant direct, indirect or cumulative adverse impacts related to Soil or Water Resources.

CONDITIONS OF CERTIFICATION

DRAINAGE EROSION AND SEDIMENTATION CONTROL PLAN

SOIL&WATER-1 Prior to site mobilization, the project owner shall obtain the CPM's approval of a site specific Drainage, Erosion and Sediment Control Plan (DESCP) that ensures protection of water quality and soil resources of the project site and all linear facilities for both the construction and operation phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in off-site flooding potential, and identify all monitoring and maintenance activities. The project owner shall complete all necessary engineering plans, reports, and documents necessary for Burlington Northern Santa Fe Railway (BNSF) and the

CMP to conduct a review of the proposed project and provide a written evaluation as to whether the proposed grading, drainage improvements, and flood management activities comply with all requirements presented herein. The plan shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1** and shall contain the following elements:

- **Vicinity Map:** A map shall be provided indicating the location of all project elements with depictions of all major geographic features to include watercourses, washes, irrigation and drainage canals, major utilities, and sensitive areas.
- **Site Delineation:** The site and all project elements shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, underground utilities, roads, and drainage facilities. Adjacent property owners shall be identified on the plan maps. All maps shall be presented at a legible scale.
- **Drainage:** The DESCP shall include the following elements:
    a. Topography. Topography for offsite areas is required to define the existing upstream tributary areas to the site and downstream to provide enough definition to map the existing storm water flow and flood hazard. Spot elevations shall be required where relatively flat conditions exist.
    b. Proposed Grade. Proposed grade contours shall be shown at a scale appropriate for delineation of onsite ephemeral washes, drainage ditches, and tie-ins to the existing topography.
    c. Hydrology. Existing and proposed hydrologic calculations for onsite areas and offsite areas that drain to the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, and show all existing, interim, and proposed drainage infrastructure and their intended direction of flow.
    d. Hydraulics. Provide hydraulic calculations to support the selection and sizing of the onsite drainage network, diversion facilities and Best Management Practices (BMPs).
- **Watercourses and Critical Areas:** The DESCP shall show the location of all onsite and nearby watercourses including washes, irrigation and drainage canals, and drainage ditches, and shall indicate the proximity of those features to

- **Clearing and Grading:** The plan shall provide a delineation of all areas to be cleared of vegetation, areas to be preserved, and areas where vegetation would be cut to allow clear movement of the heliostats. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross-sections, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The DESCP shall include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance shall be properly identified and delineated on the plan maps.
- **Soil Wind and Water Erosion Control:** The plan shall address exposed soil treatments to be used during construction and operation of the proposed project for both road and non-road surfaces including the specific identification of all chemical-based dust palliatives, soil bonding, and weighting agents appropriate for use at the proposed project site that would not cause adverse effects to vegetation. BMPs shall include measures designed to prevent wind and water erosion including application of chemical dust palliatives after rough grading to limit water use. All dust palliatives, soil binders, and weighting agents shall be approved by the CPM prior to use. With regard to erosion risk and stormwater runoff, debris and detention basins shall be installed which are sized and located to intercept storm water flow from off-site areas as it enters the project site. On-site roadways and other infrastructure shall be designed and located to avoid existing and proposed flow paths to the extent feasible.
- **Project Schedule:** The DESCP shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element construction, and final grading/stabilization). Separate BMP implementation schedules shall be provided for each project element for each phase of construction. This scheduling should require the installation of debris basins, detention/ infiltration basins,

swales, and related storm water management facilities before construction commences on each phase.

- **Best Management Practices:** The DESCP shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction.
- **Erosion Control Drawings:** The erosion-control drawings and narrative shall be designed, stamped and sealed by a professional engineer or erosion-control specialist.
- **Comments:** The DESCP shall include copies of recommendations, conditions, and provisions from the BNSF, County of San Bernardino, California Department of Fish and Game (CDFG), and Lahontan Regional Water Quality Control Board (RWQCB).
- **Monitoring Plan:** Monitoring activities shall include routine measurement of the volume of accumulated sediment in the onsite drainage ditches, and storm water diversions and the requirements specified in **Soil and Water Appendix B, C, and D.**

Verification: The DESCP shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1,** and relevant portions of the DESCP shall clearly show approval by the chief building official (CBO). In addition, the project owner shall do all of the following:

a) No later than 30 days prior to start of site mobilization, the project owner shall submit a copy of the DESCP to the County of San Bernardino, the RWQCB, BNSF and the CPM for review and comment. The CPM shall consider comments received in approving the plan.

b) During construction, the project owner shall provide BNSF and the CPM an analysis in the monthly compliance report on the effectiveness of the drainage-, erosion- and sediment-control measures and the results of monitoring and maintenance activities.

c) Once operational, the project owner shall provide BNSF and the CPM information on the results of storm water BMP monitoring and maintenance activities in the annual compliance report.

d) The project owner shall provide BNSF and the CPM with two copies each of all monitoring or other reports required for compliance with San Bernardino County, CDFG, and RWQCB.

WASTE DISCHARGE REQUIREMENTS

SOIL&WATER-2 The project owner shall comply with the Waste Discharge Requirements presented in **Soil and Water Appendices B, C, D** and **E** for the design, construction and operation of the surface impoundments (evaporation ponds) and storm water management system. These requirements relate to discharges, or potential discharges, of waste that could affect the quality of waters of the state, and were developed in consultation with staff of the State Water Resources Control Board and/or the applicable California Regional Water Quality Control Board (hereafter "Water Boards"). It is the Commission's intent that these requirements be enforceable by both the Commission and the Water Boards. In furtherance of that objective, the Commission hereby delegates the enforcement of these requirements, and associated monitoring, inspection and annual fee collection authority, to the Water Boards.

Accordingly, the Commission and the Water Board shall confer with each other and coordinate, as needed, in the enforcement of the requirements. The project owner shall pay the annual waste discharge permit fee associated with this facility to the Water Boards. In addition, the Water Boards may "prescribe" these requirements as waste discharge requirements pursuant to Water Code Section 13263 solely for the purposes of enforcement, monitoring, inspection, and the assessment of annual fees, consistent with Public Resources Code Section 25531, subdivision (c).

Verification: No later than sixty (60) days prior to any wastewater or storm water discharge, the project owner shall provide documentation to BNSF and the CPM, with copies to the LRWQCB, demonstrating compliance with the WDRs established in Appendices B, C, D and E. Any changes to the design, construction, or operation of the ponds or storm water system shall be requested in writing to the CPM, with copies to BNSF and the LRWQCB, and approved by the CPM, in consultation with the LRWQCB, prior to initiation of any changes. The project owner shall provide to the CPM, with copies to the LRWQCB and BNSF, all monitoring reports required by the WDRs, and fully explain any violations, exceedances, enforcement actions, or corrective actions related to construction or operation of the ponds or storm water system.

STORM WATER DAMAGE MONITORING AND RESPONSE PLAN

SOIL&WATER-3 The project owner shall ensure that all SunCatcher pole foundations are designed to withstand storm water scour from surface erosion and/or channel migration based on a Pole Foundation Stability Report to be completed by a Professional Engineer and Professional

Geologist. The Pole Foundation Stability Report shall establish a Minimum Depth Stability Threshold. The project owner shall also develop a Storm Water Damage Monitoring and Response Plan to evaluate potential impacts from storm water, including pole foundations that fail due to storm water flow or otherwise break and scatter mirror debris and other SunCatcher components on to the ground surface. The Storm Water Damage Monitoring and Response Plan shall include the following elements:

- Detailed maps showing the installed location of all SunCatcher pole foundations within each project phase, including existing and proposed drainage channels.
- Each SunCatcher pole foundation should be identified by a unique ID number marked to show initial ground surface at its base, and the depth to the tip of the pole below ground.
- Minimum Depth Stability Threshold to be maintained of SunCatcher pole foundations to meet long-term stability for applicable wind, water and debris loading effects;
- Above and below ground construction details of a typical installed SunCatcher pole foundation.
- BMPs to be employed to minimize the potential impact of broken mirrors to soil resources.
- Methods and response time of mirror cleanup and measures that may be used to mitigate further impact to soil resources from broken mirror fragments.

Monitor and Inspect Periodically, Before First Seasonal and After Every Storm Event:

- Security and Tortoise Exclusion Fence: Inspect for damage and buildup of sediment or debris.
- SunCatcher Pole Foundations within Drainages or Subject to Drainage Overflow: Inspect for tilting, mirror damage, depth of scour compared to foundation depth below ground and the Minimum Depth Stability Threshold, collapse, and downstream transport.
- Drainage Channels: Inspect for substantial migration or changes in depth, and transport of broken mirror glass.
- Constructed Diversion Channels: Inspect for scour and structural integrity issues caused by erosion, and for sediment and debris buildup.

Short-Term Incident-Based Response:

- Security and Tortoise Exclusion Fence: repair damage, and remove build-up of sediment and debris.
- SunCatcher Pole Foundations: Remove broken glass, damaged structures, and wiring from the ground, and for foundations no longer meeting the Minimum Depth Stability Threshold, either replace/reinforce or remove the SunCatcher to avoid exposure for broken glass.
- Drainage Channels: no short-term response necessary unless changes indicate risk to facility structures.
- Constructed Diversion Channels: repair damage, maintain erosion control measures and remove built-up sediment and debris.

Long-Term Design-Based Response:

- Propose operation/BMP modifications to address ongoing issues. Include proposed changes to monitoring and response procedures, frequency, or standards.
- Replace/reinforce SunCatcher Pole Foundations no longer meeting the Minimum Depth Stability Threshold or remove the SunCatchers to avoid exposure for broken glass.
- Propose design modifications to address ongoing issues. This may include construction of active storm water management diversion channels and/or detention ponds.

Inspection, short-term incident response, and long-term design-based response may include activities both inside and outside of the approved right-of-way. For activities outside of the approved right-of-way, the Applicant will notify BLM and acquire environmental review and approval before field activities begin.

Verification: At least 30 days prior to commercial operation, the project owner shall submit a copy of the Pole Foundation Stability Report and the Storm Water Damage Monitoring and Response Plan to BNSF for review and the CPM for review and approval prior to commercial operation. The project owner shall retain a copy of these documents onsite at the power plant at all times. The project owner shall prepare an annual summary of the number of pole foundations failed, cause of the failures, and cleanup and mitigation performed for each failed pole foundation.

CONSTRUCTION AND OPERATIONS WATER USE

SOIL&WATER-4 The proposed project's use of groundwater for all construction activities shall not exceed 145 AFY. The proposed project's use of groundwater for all operational activities shall not

exceed 21 AFY. Use of ground or other water sources in excess of these limits are prohibited unless the project owner seeks a Project Amendment.

Prior to the use of groundwater for construction, the project owner shall install and maintain metering devices as part of the water supply and distribution system to document project water use and to monitor and record in gallons per day the total volume(s) of water supplied to the project from the water source. Documentation of the installation and operation of the metering devices shall be submitted to the Commission prior to use of any groundwater for project activities. The metering devices shall be operational for the life of the project. An annual summary of daily water use by the project shall be submitted to the CPM in the annual compliance report.

Verification: At least 30 days prior to the start of construction of the proposed project, the project owner shall submit to the CPM a copy of evidence that metering devices have been installed and are operational.

Beginning six months after the start of construction, the project owner shall prepare a semi-annual summary of amount of water used for construction purposes. The summary shall include the monthly range (daily minimum and daily maximum) and monthly average of daily water usage in gallons per day.

The project owner shall prepare an annual summary, which will include daily usage, monthly range and monthly average of daily water usage in gallons per day, and total water used on a monthly and annual basis in AF. For years subsequent to the initial year of operation, the annual summary will also include the yearly range and yearly average water use by source. For calculating the total water use, the term "year" will correspond to the date established for the annual compliance report submittal.

SEPTIC SYSTEM AND LEACH FIELD REQUIREMENTS

SOIL&WATER-5 Prior to the start of construction, the project owner shall provide the design of a sanitary waste septic system that complies with the County of San Bernardino requirements for the construction and operation of the project's proposed sanitary waste septic system and leach field to the CPM for review and approval.

Project operation shall not commence until documentation equivalent to the County's required wastewater treatment system permits are issued by the County and approved by the CPM.

The project owner shall remain in compliance with the County requirements for the life of the project.

Verification: The Project owner shall submit all necessary information and the appropriate fee to the County of San Bernardino to ensure that the project has complied with the county's sanitary waste disposal facilities requirements. A written assessment prepared by the County of San Bernardino confirming that

the design of the project's sanitary waste septic system conforms with county requirements must be provided to the CPM for review and approval 30 days prior to the start of site construction.

A written assessment prepared by the County of San Bernardino of the project's compliance with county's sanitary waste disposal facilities requirements must be provided to the CPM for review and approval 60 days prior to the start of power plant operation.

DECOMMISSIONING PLAN

SOIL&WATER-6 The Project owner shall identify likely decommissioning scenarios and develop specific decommissioning plans for each scenario that will identify actions to be taken to avoid or mitigate long-term impacts related to water and wind erosion after decommissioning. Actions may include such measures as a decommissioning SWPPP, revegetation and restoration of disturbed areas, post-decommissioning maintenance, collection and disposal of project materials and chemicals, and access restrictions.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit decommissioning plans to BNSF for review and the CPM for review and approval prior to site mobilization. The project owner shall amend these documents as necessary, with approval from the CPM, should the decommissioning scenario change in the future.

GROUNDWATER LEVEL MONITORING AND REPORTING PLAN

SOIL&WATER-7 The project owner shall submit a Groundwater Level Monitoring and Reporting Plan to San Bernardino County and to the CPM for review and approval in accordance with the County of San Bernardino Code Title 3, Division 3, Chapter 6, Article 5 (Desert Groundwater Management Ordinance).
The Groundwater Level Monitoring and Reporting Plan shall provide detailed methodology for monitoring background and site groundwater levels.

Monitoring shall be conducted prior to construction, during construction, and throughout project operation. The primary objective for the monitoring is to establish pre-construction and project related groundwater level trends that can be quantitatively compared against observed and simulated trends near the project pumping well and dedicated monitoring wells. Water level measurements in the project's water supply well shall represent non-pumped conditions, and be collected a minimum of four hours after pump shut-down.

Prior to project construction, monitoring shall commence to establish pre-construction base-line conditions and reporting shall include existing monitoring data collected in the project area useful for quantifying hydraulic gradients across the Pisgah Fault and between the Lavic

Lake and Lower Mojave groundwater basins. The monitoring network shall therefore be designed to also incorporate and report relevant ongoing monitoring and reporting activities currently occurring in existing groundwater wells located within the Lavic Lake and Lower Mojave groundwater basins.

In areas where groundwater elevation data is needed but existing wells are absent or do not represent the water-bearing zone from which the project water supply well extracts groundwater, the monitoring network shall be comprised of wells screened to measure water levels representing the water-bearing zone from which the project water supply well will extract groundwater.

In addition, the project owner shall install 5 surveyed monument markers between the Railroad ROW and the water supply well, with one marker adjacent to the supply well. If the measured static groundwater level drops 5' or more, the project owner shall: (1) notify the CPM and BNSF of the drop and (2) prepare a Subsidence Mitigation Plan that will be reviewed and commented on by BNSF, and approved by the CPM.

Verification: The project owner shall complete the following:

1. At least two (2) months prior to power plant construction, a Groundwater Level Monitoring and Reporting Plan shall be submitted to the County of San Bernardino for review and comment before completion of Condition of Certification **SOIL& WATER-3**, and a copy of the County's comments and the plan shall be submitted the CPM for review and approval. The plan shall include a scaled map showing the site and vicinity, existing well locations, and proposed monitoring locations (both existing wells and new monitoring wells proposed for construction). The map shall also include relevant natural and man-made features (existing and proposed as part of this project). The plan also shall provide: (1) well construction information and borehole lithology for each existing well proposed for use as a monitoring well; (2) description of proposed drilling and well installation methods for new wells; (3) proposed monitoring well design; and, (4) schedule for completion of the work.
2. At least one (1) month prior to construction, a Groundwater Level Network Report shall be submitted to the CPM. The report shall include a scaled map showing the final monitoring well network. It shall document the drilling methods employed, provide individual well construction as-builds, borehole lithology recorded from the drill cuttings, well development, and well survey results for all new wells. The well survey shall measure the location and elevation of the top of the well casing and reference point for all water level measurements, and shall include the coordinate system and datum for the survey measurements. Additionally, the report shall describe the water level monitoring equipment employed in the wells and document their deployment and use.

3. As part of the monitoring well network development, any newly constructed monitoring wells shall be permitted and constructed consistent with San Bernardino County and State specifications.
4. At least one (1) week prior to project construction, all water level monitoring data shall be provided to the CPM. The data transmittal shall include an assessment of pre-project water level trends, a summary of available climatic information (monthly average temperature and rainfall records from the nearest weather station), and a comparison and assessment of water level data.
5. After project construction and during project operations, the project owner shall submit the monitoring data annually to the CPM. The summary shall document water level monitoring methods, the water level data, water level plots, and a comparison between pre- and post-project start-up water level trends. The report shall also include a summary of actual water use conditions, monthly climatic information (temperature and rainfall), and a comparison and assessment of water level data. As part of this assessment, the project owner shall calculate water level trends and complete a 5-year projection of future water levels based on these trends and an evaluation of water supply reliability.

STORMWATER CONTROL/FLOOD PROTECTION DESIGN PLANS

SOIL&WATER-8: The project owner shall submit two copies of the 30-percent, 60- percent and 90-percent design drawings for the grading and drainage facilities to BNSF and the CPM for review and comment. The 30-percent, 60-percent and 90-percent design drawings for the grading and drainage facilities shall be accompanied by a basis of design report to convey and support the design approach. To prepare the grading and drainage facilities drawings and accompanying basis of design report, the project owner shall do the following:

1. At a minimum, the design report shall ensure the project meets the following performance standards:

   a. Project construction and operation shall not alter the existing watershed boundaries.

   b. Project construction and operation shall not adversely affect any railroad structures through changes in the volume or velocity of storm water runoff reaching the railroad structure.

   c. No SunCatcher shall be placed in an area where adequate hydrologic studies indicate the water surface resulting from a 100 year, 24-hour storm could be more than 1.5 feet above the pre-storm ground surface.

   d. Post development runoff from the project site shall be equal to or less than predevelopment runoff.

e. Post development sediment transport through the project site shall be equal to predevelopment sediment transport.

f. At a minimum, all storm water, hydraulic and drainage reports used for project development shall comply with the requirements of the San Bernardino County Drainage Manual (SBCDM).

2. Conduct an analysis to quantify the design discharges and associated volumes of water, debris, and sediment associated with the 100-year storm at the apex of the fan under current watershed conditions.

3. Conduct a geomorphic and hydraulic analysis to determine the maximum design storm that can be routed through the site utilizing existing fluvial washes that will not result in significant damage to proposed site infrastructure.

4. Conduct a geomorphic and biologic analysis to determine the minimum design storm that can be routed through the site utilizing existing fluvial washes that will provide the necessary sediment load through the site and “downstream areas” to maintain existing sensitive habitat needs, as described in the *Geomorphic Assessment of Calico Solar Project Site.* This analysis must consider and address the need for fine sand to support the existing sensitive habitat and the potential episodic nature of the associated dune complex evolution that depends upon El Niño events (i.e., wet winters occurring approximately every three to seven years) delivering sediment to the lower fan and the accompanying La Niña events (i.e., dry winters occurring approximately every three to seven years) eroding and transporting fine sands to these dunes through wind action.

5. Determine the pass through design storm that can be routed through the site unimpeded to deliver the necessary sediment load through the site to maintain existing sensitive habitat needs in “downstream areas” and not result in significant damage to proposed site infrastructure.

6. If it is determined that detention basins are needed, size, locate, and design each basin to allow the pass through design storm to move through the site unimpeded while capturing larger design storm flows and related sediment and debris to protect the proposed infrastructure.

7. Convey design of each basin by showing supporting calculations and design drawings to convey the basin in plan view, cross-sections, depth to spillway, amount of freeboard to top of basin, basin volume to spillway, description of sidewall slopes, method of providing pass through design storm and related sediment

unimpeded, method of providing erosion protection of basin side walls, inlet design, outlet design, spillway design, spillway erosion control, combined outlet maximum flow, transition from outlet to existing downstream fluvial wash, tortoise fence location and design, maintenance of tortoise fence, maintenance of basin, maintenance of excess sediment in basin from larger flood flows.

8. The project owner shall request comments from the Department of Water Resources Division of Safety of Dams (DSOD) for the plans and specifications for the construction of any dam(s) or reservoir(s) that are under DSOD jurisdiction prior to beginning construction, and forward all comments to BNSF and the CPM.

9. For all flood control basin dams, the project owner shall provide at a minimum:

    - specific locations of basins and dams on appropriate scale map,
    - configuration of all basins and dams including basin-specific cross sections,
    - a description of all materials designed to be used in the construction of the dams,
    - footings designs,
    - designs of cutoff walls,
    - designs of keyways,
    - description and design of drainage pass though methods,
    - flow metering (ability to maintain maximum discharge to that of the maximum on-site flow design) technique and design,
    - method of and design of debris deflection (i.e. trash racks) for each basin,
    - emergency spillway design,
    - pass through pipe outlet energy dissipation method and design, and
    - basin inlet erosion protection.

10. In addition to the criteria discussed above, the basis of design report shall also follow the procedures outlined in the following documents as far as is applicable:

    a. San Bernardino County Drainage Manual and 2007 Development Code (amended, March 25, 2010).

b. Federal Emergency Management Agency Guidelines for Determining Flood Hazards on Alluvial Fans and Guidelines and Specifications for Flood Hazard Mapping Partners.

11. The project owner shall prepare a set of design specifications to supplement the 90-percent design drawings. Plans, specifications, computations and other data shall be prepared by persons properly licensed by the State of California. If the 60-percent plans or 90-percent plans and specifications do not comply with the appropriate Conditions of Certification, the necessary changes or revisions to the plans shall be made by the project owner. If the CPM finds that the work described in the plans and specifications conform to the Conditions of Certifications in the Energy Commission Decision and other pertinent LORS, then the project owner shall submit two copies of the 100- percent set for CPM review and approval. All design drawings must be submitted on bound or stapled 24" x 36" size paper.

Verification: Prior to site mobilization, the project owner shall prepare preliminary (30-percent) grading and drainage facilities drawings and accompanying basis of design report for BNSF review and CPM review and approval. No later than 30 days after publication of the Energy Commission Decision, the 60-percent set of design drawings and accompanying basis of design report shall be submitted to the BNSF for review and CPM for review and approval. The project owner shall submit the 90-percent design drawings and accompanying basis of design report to BNSF for review and the CPM for review and approval after the person who originally drew the plan or their duly authorized agent addresses the CPM's 60-percent submittal comments and required changes. The 100-percent design drawings and specifications (construction documents) shall be signed and sealed by a Registered Professional Engineer in the State of California and submitted as the final, approved set of construction documents prior to site mobilization. Prior to initiation of site construction, the 100-percent design drawings and specifications (construction documents) shall be submitted along with the final basis of design report signed and sealed by a Registered Professional Engineer and a Registered Professional Geologist in the State of California to the CPM for review and approval.

Thirty days prior to initiation of construction of any dams that would be considered under the jurisdiction of DSOD, the project owner shall receive approval for dam construction from the CPM based on comments the CPM has received from the DSOD for dam design adequacy.

WATER SUPPLY RELIABILITY

SOIL&WATER-9 The annual monitoring report required by **SOIL&WATER-7** shall include an evaluation of water supply reliability. Based on the results of this evaluation, the CPM may request the project owner develop and submit a Water Conservation and Alternative Water

Supply Plan. The purpose of this plan is to curtail and minimize water use to remediate observed water level and storage declines in the water bearing zone utilized by the project until the proposed alternative supply is available.

Verification: The project owner shall provide a Water Conservation Plan within 30 days after the request of the CPM. The plan shall be implemented immediately upon approval by the CPM. Part of this plan shall include suspension of mirror washing until the water supply has stabilized or an alternative supply is available to provide the water. The project owner shall submit a Notice of Completion to the CPM within 30 days of securing the alternative supply. The Notice of Completion shall list each plan component and document that it has been completed. Part of the documentation shall include water use records that show the conservation savings achieved. If development of an alternative water supply was part of the plan, the project owner shall provide all documentation, permits, as-builts, proof of a contract or other right to a long term supply and test results that may be required for the water supply. The Water Conservation Plan shall remain in effect until CPM approval of the project owner's Notice of Completion.

STORM WATER PERMITS

SOIL&WATER-10 NPDES GENERAL PERMIT FOR CONSTRUCTION ACTIVITY.

The project owner shall comply with the requirements of the general National Pollutant Discharge Elimination System (NPDES) permit for discharge of storm water associated with construction activity. The project owner shall submit copies of all correspondence between the project owner and the State Water Resources Control Board (SWRCB) or the LRWQCB regarding this permit to the CPM. The project owner shall also develop and implement a construction SWPPP for construction on the Calico Solar Project main site, laydown areas, pipeline, and transmission line.

Verification: The project owner shall submit a copy of the construction SWPPP to the CPM at least 10 days prior to site mobilization for review and approval, and retain a copy of the approved SWPPP on site throughout construction. The project owner shall submit copies of all correspondence between the project owner and the SWRCB or the LRWQCB regarding the NPDES permit for the discharge of storm water associated with construction activity to the CPM within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent to the SWRCB, the confirmation letter indicating receipt and acceptance of the Notice of Intent, any permit modifications or changes, and completion/permit Notice of Termination.

SOIL&WATER-11 INDUSTRIAL FACILITY SWPPP

The project owner shall comply with the requirements of the General NPDES Permit for Discharges of Storm Water Associated with

Industrial Activity, including development of an Industrial Facility SWPPP. If the Regional or State Board finds the project does not require a General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity, written confirmation from either board confirming this permit is not required would satisfy this Condition.

Verification: The project owner shall submit a copy of the Industrial Facility SWPPP for operation of the project to the CPM at least 60 days prior to the start of commercial operation and shall retain a copy of the approved SWPPP on site throughout the life of the project. The project owner shall submit copies of all correspondence between the project owner and the LRWQCB regarding the general NPDES permit for discharge of storm water associated with industrial activity to the CPM within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent by the project owner to the SWRCB, the confirmation letter indicating receipt and acceptance of the Notice of Intent, and any permit modifications or changes.

HYDROLOGY STUDY

SOIL&WATER-12 Project owner shall fund a hydrologic study commissioned by BNSF to determine the erosion and sedimentation impact, if any, on BNSF infrastructure resulting from the project owner's planned emplacement of SunCatchers, flood control structures and runoff control measures.

Verification: Within ninety (90) days of completion of the hydrologic study commissioned by BNSF, the project owner shall provide documentation to the CPM that the study has been paid in full. Within thirty (30) days of completion of the hydrologic study, the results of study shall be provided to BNSF, the CPM and the project owner.

C. CULTURAL RESOURCES

The potential for impacts to cultural resources depends upon whether such resources are present and whether they would actually be encountered during project development and construction activities. Cultural resource materials such as artifacts, structures, or land modifications reflect the history of human development. Certain places that are important to Native Americans or local national/ethnic groups are also considered valuable cultural resources. Analysis in this topic area pertains to the structural and cultural evidence of human development in the project vicinity, as well as appropriate mitigation measures should cultural resources be disturbed by project excavation and construction. Potential impacts to these resources from the proposed project may include, but are not limited to, destruction of resources, alteration of a historical feature and diminishment of the significance of a cultural resource caused by construction and operation the facility. These impacts and the thresholds for determining the significances of these impacts are discussed in this section.

The discussion focuses primarily on the requirements of the California Environmental Quality Act (CEQA), local laws, ordinances, and regulations, and eligibility of cultural resources for listing in the California Register of Historical Resources (CRHR). However, because the proposed project will be located on federal land, several federal laws are equally applicable to this project. As a result, this the discussion includes certain findings and conclusions reached by the Bureau of Land Management (BLM) relating to the National Environmental Policy Act (NEPA), consultation with Native American tribes and representatives, and eligibility of cultural resources for listing in the National Register of Historic Places (NRHP) under Section 106 of the National Historic Preservation Act (NHPA).[1]

The supporting evidence for this analysis is contained in the following exhibits: 8/18/10 RT 413-462, 8/25/10 RT 19-74, 113-118,Exs. 1, § 5.7, 57, 75,108, 129, 133, 300, §B.3, 309;§ C-2-2, 312, 441, 442.

[1] Given that the proposed Calico Solar Project is located on lands managed by BLM and requires BLM authorization, the proposed action is considered a federal undertaking, and must comply with the NHPA and implementing regulations. NEPA addresses compliance with the NHPA, and the required corresponding environmental documentation (whether it is an Environmental Assessment or an Environmental Impact Statement) must discuss cultural resources.

Determining the Historical Significance of Cultural Resources

Three kinds of cultural resources, classified by their origins, are considered in this assessment: prehistoric, ethnographic, and historic. Cultural resources are categorized as buildings, sites, structures, objects, and districts under both federal law for the purposes of the National Environmental Policy Act and the National Historic Preservation Act), Section 106, and under California state law for the purposes of the California Environmental Quality Act.

California Register of Historic Resources and CEQA

When a cultural resource is determined to be significant, it is eligible for inclusion in the California Register of Historic Resources (CRHR). (Pub. Res. Code, § 5024.1; Cal. Code Regs., tit. 14, § 4850 et seq.) An archaeological resource that does not qualify as an historic resource may be considered a "unique" archaeological resource under CEQA. (*see* Pub. Res. Code, § 21083.2.) In addition, structures older than 50 years (or less if the resource is deemed exceptional) can be considered for listing as significant historic structures. The Office of Historic Preservation's Instructions for Recording Historical Resources (1995) endorses recording and evaluating resources over 45 years of age to accommodate a five-year lag in the planning process.

The CEQA Guidelines define historical resources to include:

(1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR,

(2) A resource included in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, or

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency's determination is supported by substantial evidence in light of the whole record. [Cal. Code Regs. tit. 14, § 15064.5(a).]

Historical resources that are automatically listed in the CRHR include California historical resources listed in or formally determined eligible for the National Register of Historic Places (NRHP) as well as California Registered Historical Landmarks from No. 770 onward. [Pub. Res. Code, § 5024.1(d).]

Under the CEQA Guidelines, a resource is generally considered to be historically significant if it meets the criteria for listing in the CRHR. These criteria are essentially the same as the eligibility criteria for the NRHP. In addition to being at least 50 years old, a resource must meet at least one of the following four criteria: (1) it is associated with events that have made a significant contribution to the broad patterns of our history (Criterion1); (2) it is associated with the lives of persons significant in our past (Criterion 2); (3) the resource embodies the distinctive characteristics of a type, period, or method of construction, or that it represents the work of a master, or possesses high artistic values (Criterion 3); or, (4) the resource has yielded, or may be likely to yield, information important to history or prehistory (Criterion 4). (Pub. Res. Code § 5024.1.) Historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (Cal. Code Regs., tit. 14, § 4852(c); Pub. Res. Code § 5020.1 (j), 5024.1).

Even if a resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows the lead agency to make a determination as to whether the resource is a historical resource.

Resources include historic district or landscapes. There are state and federal guidelines for evaluating whether certain resources are historic districts. The National Park Service defines a historic district as “a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development” (U.S. Department of the Interior, National Park Service 2002:5).For a grouping of cultural resources to be considered eligible for listing in the NRHP as a “district,” those resources must be historically or functionally related and visually convey a historical theme or environment. In addition, the district must possess sufficient historical significance and integrity.

The California Code of Regulations similarly defines historic districts as “unified geographic entities which contain a concentration of historic buildings, structures, objects, or sites united historically, culturally, or architecturally. Historic districts are defined by precise geographic boundaries. Therefore, districts with unusual boundaries require a description of what lies immediately outside the area, in order to define the edge of the district and to explain the exclusion of the adjoining areas” [Title 14, California Code of Regulations, Chapter 11.5, Section 4852(a)(5)].

With respect to historic landscapes, the National Park Service provides the following definition: “a geographical area that historically has been used by people, or shaped or modified by human activity, occupancy, or intervention, and that possesses a significant concentration, linkage, or continuity of areas of land use, vegetation, buildings and structures, roads and waterways, and natural features” (U.S. Department of the Interior, National Park Service 1999:1-2).

Historic landscapes exhibit evidence of human use or activities and typically are one of the following types: agriculture (including various types of cropping and grazing); industry (including mining, lumbering, fish-culturing, and milling); maritime activities such as fishing; shell fishing, and shipbuilding recreation (including hunting or fishing camps); transportation systems; migration trails; conservation (including natural reserves), and sites adapted for ceremonial, religious, or other cultural activities, such as camp meeting grounds (U.S. Department of the Interior, National Park Service 1999:3).

Although the National Park Service recognizes the cultural landscape categories as descriptive terms, landscapes that are listed in or determined eligible for the NRHP are officially classified as districts. Sites are small landscapes with no buildings or structures as sites. Larger landscapes with numerous buildings, structures, and sites are classified as districts.

NEPA and National Historic Preservation Act

As discussed above, this discussion also considers actions and determinations of BLM under NEPA and Section 106 of the National Historic Preservation Act (NHPA). (16 United States Code [USC] 470f).) NEPA is implemented by regulations of the Council on Environmental Quality, 40 CFR 1500-1508. In summary, NEPA establishes national policy for the protection and enhancement of the environment. Part of the function of the Federal Government in protecting the environment is to “preserve important historic, cultural, and natural aspects of our national heritage.”

Cultural resources are not required to be NHPA to receive consideration under NEPA.

Section 106 of NHPA requires federal agencies to consider the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings (36 CFR Part 800.1). Under

Section 106, the significance of any adversely affected cultural resource is assessed and mitigation measures are proposed to resolve such effects.

Under NHPA (36 CFR Part 800), significant resources that might be affected by the undertaking must be identified. Significant cultural resources (historic properties) are those resources that are listed in or are eligible for listing on the NRHP per the criteria listed at 36 CFR 60.4 (Advisory Council on Historic Preservation 2000). Impacts to the resources must be identified and mitigation measures must be developed an implemented to offset or eliminate adverse impacts. All three steps require consultation with interested Native American tribes, local governments, and other interested parties.

Value criteria for NRHP eligibility fall into the following categories:

1. **Associate Value (Criteria A and B):** Properties significant for their association with or linkage to events (Criterion A) or persons (Criterion B) important in the past.

2. **Design or Construction Value (Criterion C):** Properties significant as representatives of the man-made expression of culture or technology.

3. **Information Value (Criterion D):** Properties significant for their ability to yield important information about prehistory or history.

Cultural resources deemed eligible for listing in the NRHP (with State Historic Preservation Officer (SHPO) concurrence), are termed “historic properties” under Section 106, and are afforded the same protection as sites listed in the NRHP.

Criteria for Determining the Significance of Project Impacts on Historically Significant Cultural Resources

Guided by the requirements of CEQA, NEPA, and Section 106, we evaluated the character of the effects or impacts that a proposed project may have on historically significant cultural resources. The analysis takes into account three primary types of potential impacts: 1) direct effects or impacts, (2) indirect effects or impacts, and (3) cumulative effects or impacts. We discuss the character of the potential impact, whether each such effect is significant, relative to specific regulatory criteria under CEQA, NEPA, and Section 106, and feasible mitigation.

Direct and Indirect Impacts under CEQA

In general, direct impacts to cultural resources are those associated with project development and construction. Construction usually entails surface and

subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historic built-environment resources when those structures must be removed to make way for the project or when the vibrations of construction impair the stability of historic structures nearby.

New structures can have direct impacts on historic structures when the new structures are stylistically incompatible with their neighbors and the setting, and when the new structures produce something harmful to the materials or structural integrity of the historic structures, such as emissions or vibrations.

Indirect impacts to cultural resources and archaeological resources in particular, are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historic structures can suffer indirect impacts when project construction creates improved accessibility and vandalism or greater weather exposure becomes possible. (Ex. 309, pp. C.2-7 – C.2-11.)

Direct and Indirect Effects under NEPA

The concepts of direct and indirect effects under NEPA are almost equivalent to those under CEQA. Direct effects under NEPA are those "which are caused by the [proposed or alternative] action and [which] occur at the same time and place" (40 CFR § 1508.8(a)). Indirect effects are those "which are caused by the [proposed or alternative] action and are later in time or farther removed in distance, but are still reasonably foreseeable" (40 CFR § 1508.8(b)).

Direct and Indirect Effects under Section 106

The Section 106 regulation narrows the range of direct effects and broadens the range of indirect effects relative to the definitions of the same terms under CEQA and NEPA. The regulatory definition of "effect," pursuant to 36 CFR § 800.16(i), is that the term "means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register." In practice, a "direct effect" under Section 106 is limited to the direct physical disturbance of a historic property. Effects that are immediate but not physical in character, such as visual intrusion, and reasonably foreseeable effects that may occur at some point subsequent to the implementation of the proposed undertaking are referred to in the Section 106 process as "indirect effects."

Cumulative Impacts

The concept of cumulative impacts applies under CEQA and NEPA. Although each law has its own definition of cumulative impacts, both definitions

encompass the idea that cumulative impacts reaches beyond the project area of analysis or the area of potential effects. It is a consideration of how the effects of a proposed or alternative action in those areas contributes or does not contribute

to the degradation of a resource group or groups that is or are common to the project area of analysis and the surrounding area or vicinity. (Pub. Resources Code sec. 21083; Cal. Code Regs., tit. 14, secs. 15064(h), 15065(a)(3), 15130, and 15355, 40 CFR § 1508.7, (40 CFR § 1508.27(b)(7).)

Cumulative Effects under Section 106

The Section 106 regulation makes explicit reference to cumulative effects only in the context of a discussion of the criteria of adverse effect (36 CFR § 800.5(a)(1)). Cumulative effects are largely undifferentiated as an aspect of the potential effects of an undertaking. Such effects are enumerated and resolved in conjunction with the consideration of direct and indirect effects.

Section 106 regulation makes explicit reference to cumulative effects only in the context of a discussion of the criteria of adverse effect (36 CFR § 800.5(a)(1)). Cumulative effects are largely undifferentiated as an aspect of the potential effects of an undertaking. Such effects are enumerated and resolved in conjunction with the consideration of direct and indirect effects.

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Project Area of Analysis

The project area of analysis (or “project area”) is the area within and surrounding the Calico Solar project site, as well as all associated linear facility corridors. The evidence shows that the area reflects the minimum standards set out in the Energy Commission Power Plant Site Certification Regulations (Cal. Code Regs., tit. 20, § 1701 et seq., Appen. B, subd. (g)(2)) and is large and comprehensive in geographic area to facilitate and encompass considerations of both direct and indirect effects to archaeological, ethnographic, and built-environment resources.

The project area is a composite geographic area that allows for analysis of the following resource types:

- For archaeological resources, the project area of analysis is minimally defined as the project site footprint, plus a buffer of 200 feet, and all project linear facilities routes, plus a buffer of 50 feet to either side of the rights-of way for these linear routes.

- For built-environment resources, the project area of analysis is confined to one parcel deep from the project site footprint in urban areas, but in rural areas is expanded to include a half-mile buffer from the project site and above-ground linear facilities to encompass resources whose setting could be adversely affected by industrial development.
- For a historic district or a cultural landscape, the project area of analysis is based on the particular characteristics of each siting case (i.e., specific to that project).
- For ethnographic resources, the project area of analysis is expanded to take into account traditional use areas and traditional cultural properties which may be far-ranging, including views that contribute to the significance of the property. These resources are often identified in consultation with Native Americans and other ethnic groups, and issues that are raised by these groups may define the area of analysis. (Ex. 309, pp. C-2-3 – C-2-4.)

2. Physical Setting

The proposed Calico Solar project is located on 4,613 acres in eastern San Bernardino County within the central Mojave Desert, approximately 115 miles east of Los Angeles and 37 miles east of Barstow, California. Nearby communities include Newberry Springs and Ludlow, both approximately 12 miles to the west and east, respectively, of the project site.

The project site is situated on the north side of Interstate-40 (I-40), primarily east of Hector Road. The southern project boundary borders I-40, the western boundary borders undeveloped BLM land, the southeastern boundary borders an existing transmission line; and the northern and eastern site boundaries border the base of the Cady Mountain range.

The Cady Mountain Wilderness Study Area and the Sleeping Beauty Proposed Wilderness Area are located north and northeast, respectively, of the project area. Pisgah Crater, located within the Pisgah Area of Critical Environmental Concern, is located south of the project site.

The project area is rural but there is evidence of prior land use activities in the form of dilapidated mining-related structures, mining processing equipment, corrals, water tanks, barbed wire fencing, and several underground and above-ground utilities. The primary sources of previous disturbance within and adjacent to the project area include cattle grazing, off-road vehicle use, historic mining

activities, construction of a series of underground pipelines, construction and use of the Southern California Edison (SCE) Pisgah Substation and associated transmission lines, and the construction and use of a number of transportation routes, including the Burlington Northern Santa Fe (BNSF) railroad tracks,[2] the National Old Trails Road, U.S. Route 66, and I-40.

3. Environmental Setting

a. Geology and Geomorphology

The Project area is located within the geomorphic province of the Mojave Desert, which occupies approximately 25,000 square miles of southeastern California The Mojave Desert is a wedge shaped area largely bound by major faults and structurally referred to as the Mojave Block.

The Mojave Desert Geomorphic Province is characterized by broad expanses of desert with localized mountains and dry lakebeds and is bound by the San Bernardino Mountains and the Pinto fault to the south, the San Andreas fault to the west, the Garlock fault to the north and the Basin and Range Province to the east. The Mojave Block has a series of northwest to southeast striking faults referred to as the Eastern California Shear Zone (ECSZ).

The project area of analysis is within a broad valley between the Southwestern and Southeastern Cady mountains, in the central portion of the Mojave Desert Geomorphic Province. (Ex. 309, pp. C.2-21 – C.2-22.) More particularly, the area is characterized by Holocene-age and Pleistocene-age alluvial deposition. Alluvial deposits from the adjacent highlands are composed of silty sands and gravels with localized gravel and cobble channels.

The Mojave River has been a significant factor affecting the geomorphology of the Mojave region, and specifically the Calico Solar project area of analysis. This river and its drainage system represent the largest present-day hydrological system in the Mojave Desert. Climate changes and the changing path of the Mojave River resulted in the formation of several freshwater lakes including Lake Manix, which consists of several subbasins. It appears that at one point in time, the Lake Manix shoreline reached an elevation of 557 meters. At this level, the southern extent of the lake itself would have pushed east, potentially abutting the westernmost Calico Solar project area of analysis. Extensive prehistoric remains

[2] This railway was formerly known as the Atlantic & Pacific Railroad/Atchison Topeka & Santa Fe Railroad.

are found along the shores of Lake Manix, indicating that this lake was an important element in a regional network involving the inhabitants of the project area.

Desert pavements occur within the Calico Solar project area of analysis**.** In particular, the pavements on the slopes of the Cady Mountains are broader and better developed atop the older, up-slope Pleistocene fanglomerates as compared to the younger surfaces at lower elevations. The older surfaces, and likely the younger ones as well, predate the accepted presence of man in the new world. The most stable pavements, and likely the oldest, lie atop Quaternary alluvium woven among the fanglomerate hills and lava flows within the southern portion of the project area of analysis. Buried cultural deposits are not likely to be found beneath these stable surfaces. (Ex. 309, pp. C-2-22 – C-2-23.)

b. Paleoecology.

The Calico Solar project is located within the Mojave Valley-Granite Mountains ecological subsection (Subsection 322Ah) of the broader Mojave Desert. The general environmental setting is that of a wide valley within arid desert, along which is an expansive alluvial fan that is divided by numerous unnamed south-southwest trending washes and ephemeral drainages.

The project area is composed of multiple Life Zones whose animal and plant communities attracted and tempered the settlement and adaptations of a long sequence of prehistoric and historic populations. The Life Zones are identified as: Arctic/Alpine (10,000 feet and above), Canadian/Hudsonian (7,000 to 10,000 feet), Transition (5,000 to 7,000 feet), Upper Sonoran (3,300 to 5,000 feet), and Lower Sonoran (3,300 feet and below). Most settlement and subsistence activities were concentrated in the Transition, Upper Sonoran, and Lower Sonoran Zones.d -227 feet in altitude (approximately a mile vertical distance).

The inhabitants of the project area are presumed to have lived primarily in the Lower Sonoran Life Zone, when Troy Lake, Lavic Lake, and Broadwell Lake were wet. During times when the lakes were dry, settlement and subsistence were focused on the Upper Sonoran Life Zone in the Cady Mountains and beyond. (Ex. 309, pp. C.2-23-24.)

c. Geoarchaeological Investigation.

The record describes the geoarchaeological sensitivity analysis performed by the Applicant to assess the potential for buried archaeological sites with no surface manifestations. (Exs. SES 2009dd, 309, p. C-2-25.) The Applicant identified major landforms within the project area using aerial photography in combination with existing geologic maps of the area. This information then informed assumptions that the Applicant verified and modified during an initial field reconnaissance. This reconnaissance included an on-the-ground examination of the landscape and key indicators such as relative slope, desert pavement development, and subsoil formation. It also included subsurface examinations.

The Applicant's boring and test pit activity is detailed in the record. According to the Applicant, no archaeological materials were observed during any of the geotechnical borings or test pits. (Exs. 1, 309, pp. C-2-24 to C-2-25.)

The Applicant also identified and described major landforms within the project area. (Ex. 309, pp. C.2-25 to C.2-36.) **Cultural Resources Table 1** below summarizes the potential for these land forms to harbor buried archaeological deposits. As shown by the Applicant's investigatory results, there is a range of no to low potential for all areas except the Axial Channel of the southern section, which shows very low to moderate potential.

Cultural Resource Table 2
Summary of Geoarcheological Sensitivity of Landforms within the Calico Solar Project Study Area

Area	Landform	Age	Depositional Regime*	Sensitivity
Northern Section	Rock Outcrops	Tertiary or older	Erosional	None
	Upper Alluvial Fan Piedmont	Pleistocene to Mid-Holocene	Erosional	Very Low
	Lower Alluvial Fan Apron	Pleistocene to Holocene	Variable	Low
Southern Section	Pisgah Lava	Late Pleistocene	Stable	None to very low
	Erosional Fan Remnant (fanglomerate)	Pleistocene	Erosional	Very Low
	Inset Fans	Pleistocene to Holocene	Variable	Very Low to Low
	Relict Alluvial Flat	Pleistocene (?)	Erosional (variable)	Very Low
	Axial Channel (and associated minor landforms)	Late Holocene	Variable	Very Low to Moderate

Staff provided supplementary narrative regarding each identified landform and restated the significant conclusions of the Applicant's geoarchaeological investigation. (Ex. 309, pp. C-2-25 to C-2 -36.)

As explained by Staff, the Applicant's investigation indicates that the axial channel and associated deposits may represent the only geomorphic feature in the Calico Solar project area where buried archaeological deposits (with no surface manifestation) may reasonably be expected. (Ex. 309, pp. C-2-36 to C-2-37.) If present, these deposits will likely be sparse, in aerially confined sites, and buried under up to two meters of very recent fine-grain alluvium.

Because the vast majority of the northern alluvial fan piedmont is represented by a subsurface depositional environment that is too high-energy and coarse, with no observed paleosols, to preserve buried archaeological deposits, buried deposits are not expected in this portion of the project area. The lack of depositional sensitivity together with an absence of economically viable lithic resources and high-energy erosional contacts between buried paleo-surfaces and overlying mantle deposits within the fan aprons, largely precludes the

presence of buried archaeological deposits within in this portion of the project area as well. (*Id.*)

Both the very old age and largely erosional nature of the major landforms in the southern section of the project area indicate that buried archaeological sites (with no surface manifestation) are very unlikely. It appears that the greatest potential for site burial in the southern portion of the Calico Solar project area is in those places where unconsolidated and active eolian sands have obscured alluvial landforms. However, these eolian features appear to be so limited that they are unlikely to obscure any significant portion of an archaeological site. (Id.)

The information obtained from the investigation further indicates that prehistoric site location within the Calico Solar project area seems to be largely dictated by the availability of raw lithic materials. The series of coalescing fans that make up the alluvial fan piedmont north of the railroad tracks have their source in the Cady Mountains.

The evidence indicates that the dominant material present above these fans is granite to quartz monzonite, with more limited and likely more resistant outcrops of basalt and andesite. For instance, the subsurface geoarchaeological investigations of the alluvial fans show that the majority of material present is coarse-grained granitic sands, gravels, and cobbles, with little utility for prehistoric tool making. In comparison, the fanglomerate remnant alluvial fans and inset alluvial fans, which are generally comprised of reworked fanglomerates that make up the majority of the landforms south of the railroad tracks, have a much more variable parent material and are more conducive to prehistoric tool production. (Ex. 309, pp. C.2-36 to C.2-37.)

4. Historical Setting

a. Prehistoric Background

Human populations have occupied the California desert for at least 10,000 years. The Paleo-Indian Complex (about 10,000–8000 cal B.C.) occurred during the first half of the early Holocene. A common theme among nearly all North American Paleo-Indian sites was tool assemblages of fluted projectile points. The Lake Mojave Complex (ca 8000-6500 cal B.C.) occurred during the second half of the early Holocene and is characterized Lake Mojave projectiles (leaf-shaped, long-stemmed points with narrow shoulders) and Silver Lake projectiles (short-bladed, stemmed pints with distinct shoulders), abundant bifaces, flaked stone crescents,

and a variety of large, well-made scrapers, gravers, perforators, heavy core tools, and ground stone implements. (Ex. 309, pp. C.2-37 to C.2-38.)

The Pinto Complex (ca. 6500-4000 cal. B.C.) spans portions of the early and middle Holocene. Toolstone use, based on sites attributed to this complex, focus upon use of flaked stone technology, including less reliance on obsidian and cryptocrystalline silicates, as well as the prevalence of ground stone implements in the material culture. Beginning roughly in 3000 to 2000 BC, conditions in the Mojave Desert were warmer and drier and few archaeological sites date to this period. This suggests population densities were very low and it is possible some areas were largely abandoned. The Gypsum Complex (ca. 2000 cal B.C.–cal A.D. 200), is characterized by medium to large stemmed and corner notched projectile points, including Elke series, Humboldt Concave Base, and Gypsum.

During the Rose Spring Complex (ca cal. A.D. 200 - 1100), cultural systems changed in the southern California deserts with the introduction of the bow and arrow. During this time, a major increase in population appears to have occurred, possibly resulting in part from a more efficient hunting technology. During the Late Prehistoric Period (cal. A.D. 1100–Contact), horticultural practices and pottery were introduced (most likely from the Anasazi in the southwest). Characteristic artifacts of this Complex include Desert series projectile points, Brownware ceramics, and unshaped handstones and millingstones. The use of obsidian dropped off during this time with the increase used of cryptocrystallined silicates. (Ex. 309, pp. C-2-37 to C-2- 43.)

b. Ethnographic Background

Ethnographic resources represent the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, or Asian immigrants. These resources can include traditional resource collecting areas, ceremonial sites, topographic features, cemeteries, shrines, or ethnic neighborhoods and/or structures.

During prehistoric times, there was a large movement of people across the Mojave Desert and ethnographically, several groups are associated with the project area of analysis and surrounding Mojave Desert region. (Ex. 309, p. C-2-44.) The Kawaiisu, Kitanemuk, Southern Piute, Serrano, Chemhuevi, Tabtulabal, and Panamint occupied the Mojave Desert region to the north, south, west, and east of the project site. (Ex. 309, p. C-2-44.)

The Serrano, Vanyume (Beñeme), and the Chemehuevi occupied the region in which the project is located. However, the project area of analysis and surrounding valleys were not conducive for large scale inhabitation based on the fluctuating environmental conditions and overall arid nature of the region; therefore, groups occupying and using the area would have been small and nomadic. (Ex. 309, pp. C-2-44 to C-2-48.)

Other groups who used and occupied the Mojave Desert included the Anasazi and Mohave. The Anasazi of southern Nevada influenced cultures within the region as they traveled to take advantage of turquoise deposits. The Mohave similarly influenced the culture of the region even though they lived southeast of the project area, along the east and west banks of the Colorado River, as they traveled throughout southern California and northern Arizona spreading new technologies, beliefs, and ideas throughout the desert southwest region. (Ex. 309, pp. C.2-47 to C-2-48.)

c. Major Regional Historical Themes

The major historical themes for the Mojave Desert region and the Calico Solar vicinity in particular, are centered on the establishment of transportation routes, water access, mineral exploitation, and military uses. (Ex. 309, pp. C.2-49 to C-2-61.)

Soon after California was granted statehood in 1850, the government sought to promote immigration to the state, facilitate trade and communication, and develop routes of defense by recognizing all of the trails running through California. (Ex. 309, p. C-2-50.) In the late 1850s the General Land Office in California began the process of mapping the Mojave Desert areas. (Ex. 309, p. C.2-51.) Beale's Wagon Road was built in 1857 north of the project area and was used through 1861. However, it appears that most of the traffic through the Mojave Desert into Southern California took place via the Old Spanish Trail to the west of the project area or the Mojave Road to the north.

After the Civil War ended, the Atlanta & Pacific Railroad (A & P) partnered with the St. Louis & San Francisco Railroad and the Atchison, Topeka, & Santa Fe Railroad to construct a transcontinental railroad that would include a railway from the east to the California border. (Ex. 309, p. C.2-51.) The Southern Pacific Railroad also constructed a rail line that ran between Mojave and Needles. (Ex. 309, p. C-2-52.)

The Southern Pacific's route through the Mojave Desert facilitated mining operations. This railroad, which was later acquired by A&P, changed the course of travel across the Mojave Desert in the project vicinity by facilitating the transport of miners to the region.

By 1885, the California Southern Railroad and A&P joined to provide service from Kansas City to San Diego. The junction of the lines was located at what is now known as Barstow. This rail service brought more settlers and miners to the area and was a popular line for freight and passenger service. (The A&P is now known as the Burlington Northern Santa Fe Railway). Specifically with respect to mining, the desert region has produced a variety of mineral deposits, including gold, silver, manganese, and copper. The period between 1900 and 1919 was known as the "Great Years" for mining in northeastern San Bernardino County. (Ex. 309, p. C.2-57.) Mining still occurs in the desert area, particularly around the Kings Mountains in the vicinity of Interstate 15. (Id.)

Automobile travel across and within the Mojave Desert area first developed using existing wagon roads. By the early twentieth century, the automobile became the preferred means of transportation, and in 1916, Congress approved the Federal Highway Aid Act to help fund rural roads. In 1926, the National Old Trails Road in the Mojave Desert was redesignated as U.S. Route 66. The section of U.S. Route 66 from Needles to Los Angeles was the most heavily traveled section of the highway. While accommodations in the project area were limited to road-side camping, the heavy use of U.S. Route 66 caused thousands of businesses to emerge, such as grocery stores, service stations, restaurants, and motels, to serve cross-country travelers. (Ex. 309, pp. C-2-54 to C.2-55.)

Throughout the 1950s and 1960s, U.S. Route 66 served as the primary road between the midwest and west coast. It was eventually replaced by a newer interstate highway system. (Id.)

In 1958, Interstate 15 opened between Victorville and Barstow and began the modern highway era in the Barstow area. Thereafter, in 1961, the entire length of Interstate 15 from Los Angeles to Las Vegas was opened. (Ex. 309, p. C-2-56.) Interstate 40 begins at the junction of Interstate 15 with Interstate 40 in Barstow. Interstate 40 runs through the Mojave Desert to Needles and into Arizona. Interstate 40 is located along the southern edge of project area of analysis. The segment of Interstate 40 in the project vicinity was not constructed until 1968.

In addition to transportation improvements, the region saw other development. For instance, the Hoover Dam was constructed between 1931 and 1935 and power production for use began in 1936. Furthermore, the SCE 220-kilovolt North and South transmission lines, constructed between 1939 and 1941, originate at the SCE switchyard at the Hoover Dam and terminate in Chino, California. The lines were constructed to deliver power from the Hoover Dam to SCE service areas in southern California. (Ex. 309, p. C-2-58.)

5. Cultural Resources at the Calico Solar Site

a. Records Searches

The Applicant performed a literature and records search including all known cultural resources within a one-half-mile radius of the plant site, laydown area, and appurtenant linear facilities. Sources checked included:

- The San Bernardino Archaeological Information Center (SBAIC), which is the California Historical Resource Information System (CHRIS) cultural resources database repository for San Bernardino County;
- Previously documented cultural resources or archaeological studies in the project area and a one-mile search radius;
- National Register of Historic Places (NHRP);
- California Register of Historical Resources (CRHR);
- California Landmarks; and
- California Places of Historical Interest (Ex. 309, p. C.2-62.)

The SBAIC/CHRIS literature research shows that cultural resources studies have been conducted within the project footprint and a one-mile search radius. One of these studies (Class II inventory–literature review) was prepared for the BLM on behalf of the Applicant, and was submitted in August of 2006. This earlier report provided a preliminary assessment of the project area and includes a cultural resource record search results and background setting, but does not include a pedestrian survey of the Calico project area. It appears that about 95 percent of the Calico project area had not been previously investigated.

Nineteen of the previous survey reports within the record search radius were positive for cultural resources, 10 of those reports pertain to the Calico Solar project footprint. With the exception of a few recent studies, the majority of these previous investigations were conducted more than 15 years ago. (Ex. 309, pp.

C.2-63 to C.2-64.) The various survey reports are identified with particularity in the record. (Id.)

Sixty-eight previously documented cultural resources were identified in the project area of analysis and the one-mile search radius. Of these resources, 24 are prehistoric isolates, 38 are prehistoric archaeological sites, and six are historic-era resources (two of which are built-environment properties). Sixteen of these previously recorded cultural resources occur either partially or fully within the Calico project area of analysis**,** including one prehistoric isolate, twelve prehistoric archaeological sites, one historic archaeological site, and two historic built-environment resources. (Ex. 309, pp. C-2-66 to C-2-67.) **Cultural Resources Table 2** below identifies the 68 previously recorded cultural resources.

Cultural Resources Table 2:
Previously Recorded Cultural Resources Within the Calico Project Area and One-mile Radius

Resource Designation	Cultural Resource Type	Cultural Resource Description	In Project Footprint	Within the one-mile research radius	Latest Update
36-061415	Prehistoric	Isolated jasper flake		X	1990
36-061416	Prehistoric	Two isolated chalcedony flakes		X	1990
36-061417	Prehistoric	Isolated chalcedony flake		X	1990
36-061420	Prehistoric	Isolated chalcedony flake and isolated rhyolite flake		X	Unknown
36-061421	Prehistoric	Isolated jasper flake		X	1991
36-061423	Prehistoric	Isolated cryptocrystalline flake		X	1990
36-061424	Prehistoric	Isolated white cryptocrystalline flake		X	1990
36-061425	Prehistoric	Isolated white cryptocrystalline flake		X	1990
36-061426	Prehistoric	Isolated red cryptocrystalline flakes		X	1990
36-061427	Prehistoric	One isolated red cryptocrystalline flake tool and one red cryptocrystalline flake		X	1990
36-061428	Prehistoric	Two isolated cryptocrystalline flakes		X	1990
36-061429	Prehistoric	Isolated cryptocrystalline silicate flake		X	1990
36-061430	Prehistoric	Isolated cryptocrystalline silicate flake		X	1990
36-061431	Prehistoric	Isolated cryptocrystalline		X	1990

Resource Designation	Cultural Resource Type	Cultural Resource Description	In Project Footprint	Within the one-mile research radius	Latest Update
		silicate flake			
36-061432	Prehistoric	Isolated cryptocrystalline silicate flake		X	1990
36-061433	Prehistoric	Two isolated cryptocrystalline silicate flakes		X	1990
36-061434	Prehistoric	Isolated cryptocrystalline silicate flake		X	1990
36-061435	Prehistoric	Isolated cryptocrystalline silicate flake		X	1990
36-061436	Prehistoric	Isolated cryptocrystalline silicate flake		X	1990
36-064406	Prehistoric	Isolated chert flake and one piece of angular waste		X	2001
36-064407	Prehistoric	Two isolated chalcedony flakes	X		2001
36-064408	Prehistoric	Isolated red jasper flake fragment		X	2001
36-064409	Prehistoric	Isolated agate bifacial core		X	2001
36-064410	Prehistoric	One isolated red jasper flake and a second flake with dorsal scars		X	2001
CA-SBR-10649H	Prehistoric	Small lithic test and quarry area with flakes and one core	X		2001
CA-SBR-1585	Prehistoric	Also known as EM-266, this is a Petroglyph Site		X	1976
CA-SBR-1793	Prehistoric	Pottery sherds, awl, two bifaces		X	1963
CA-SBR-1889	Prehistoric	Lithic scatter containing metates, projectile points and debitage		X	1969
CA-SBR-1893	Prehistoric	Also known as SBCM 674, this site consists of two projectile points, scrapers flakes and bone which were collected at time of recordation	X		1963
CA-SBR-1905	Prehistoric	Jasper quarry with sparse scatters consists of flakes, bifaces and scrapers		X	1980
CA-SBR-1907	Prehistoric	Large quarry area containing debitage, cores and bifaces		X	1990
CA-SBR-1908	Prehistoric	Low density; sparse cobble testing/ quarry area consisting of cryptocrystalline silicate, basalt and rhyolite materials.	X	X	1979

Resource Designation	Cultural Resource Type	Cultural Resource Description	In Project Footprint	Within the one-mile research radius	Latest Update
CA-SBR-2910H	Historic	Also known as National Old Trails Road/Highway 66/ SM364. This is an early 20th century two lane paved road at Mile Post 183 where it becomes a graded dirt road.	X	X	2001
CA-SBR-3515	Historic/ Prehistoric	Two rock rings, it was not determined if they were historic or prehistoric		X	1978
CA-SBR-3516	Prehistoric /Historic	Lithic quarry site containing flakes and cores of chert material and historic trash scatter		X	1991
CA-SBR-3076	Prehistoric	Chalcedony lithic scatter	X		1985
CA-SBR-4307	Prehistoric	Several lithic scatters		X	1980
CA-SBR-4308	Prehistoric	Two lithic reduction stations that contain flakes and cores		X	1980
CA-SBR-4309	Prehistoric	Lithic scatter with a lithic reduction station. Possible basalt and andesite tools present on site.		X	1980
CA-SBR-4405H	Historic	A booth and cargo loading platform located where the railroad splits.		X	1980
CA-SBR-4558H	Historic	Also known as SBCM 4918, This site is a 1930s and 1940s manganese mining area containing a galvanized steel structure, mill tailings, mine and historic trash scatters	X	X	1979
CA-SBR-4681	Prehistoric	Lithic scatter	X		1980
CA-SBR-5600	Prehistoric	Lithic reduction station	X		1980
CA-SBR-5598	Prehistoric	Large cobble test/quarry area		X	1991
CA-SBR-5599	Prehistoric	Lithic scatter and rock rings		X	1980
CA-SBR-5794	Prehistoric	Cobble quarrying and lithic reduction area		X	1989
CA-SBR-5795	Prehistoric	Lithic scatter originally containing 100s of flakes, several biface fragments and cores		X	2001
CA-SBR-5796	Prehistoric	Low density lithic scatter containing flakes and cores	X		2001
CA-SBR-6511	Prehistoric	Very large low density lithic scatter containing debitage and shatter	X		1989
CA-SBR-6512	Prehistoric	Also known as MP-26, this is a small low density lithic scatter that contains debitage		X	1989

Resource Designation	Cultural Resource Type	Cultural Resource Description	In Project Footprint	Within the one-mile research radius	Latest Update
CA-SBR-6513	Prehistoric	Also known as MP-27, this is a single segregated lithic reduction locus containing approximately 15 felsite flakes total		X	1989
CA-SBR-6517	Prehistoric	Small flake scatter with one core and eight flakes		X	1989
CA-SBR-6518	Prehistoric	Small cobble test and quarry area with two segregated reduction loci and debitage		X	1989
CA-SBR-6519	Prehistoric	A single Segregated Reduction Locus made up of approximately four flakes		X	1989
CA-SBR-6520	Prehistoric	Small cobble test and quarry area with one segregated reduction locus and debitage	X		1989
CA-SBR-6521	Prehistoric	Low density cobble test and quarry area with debitage, cores, bifaces and blanks	X		1989
CA-SBR-6522/H	Prehistoric and Historic	Low density cobble test and quarry area with debitage, cores, bifaces and blanks		X	1989
CA-SBR-6525	Prehistoric	Also known as MP-84, this is a low density lithic scatter that contains one lithic reduction locus flakes and debitage		X	1989
CA-SBR-6526	Prehistoric	Also known as MP-85, this site contains two adjacent lithic reduction loci and flakes		X	1989
CA-SBR-6527	Prehistoric	Also known as MP-86, this site is a small low density flaked stone scatter		X	1989
CA-SBR-6528	Prehistoric	Also known as MP-87, this is a small density lithic scatter	X		1989
CA-SBR-6693H NRHP E SBR 94028	Historic	Railroad Line built in 1883 for the Atlantic and Pacific Railroad Co., associated artifacts include track and train parts, railroad tableware, and insulator glass fragments	X	X	2001
CA-SBR-6786	Prehistoric	Cobble quarrying area comprised of approx. 200 flakes and four cores		X	1990
CA-SBR-6836	Prehistoric	Small lithic scatter containing approximately six jasper flakes		X	1991
CA-SBR-6895	Prehistoric	Single Segregated Reduction Locus containing flakes		X	1990
CA-SBR-10637	Prehistoric	Small lithic scatter containing at least nine chert flakes		X	

Resource Designation	Cultural Resource Type	Cultural Resource Description	In Project Footprint	Within the one-mile research radius	Latest Update
P1084-1	Historic	Two sets of foundations (one concrete and one concrete slab)		X	
P1793-1H	Historic	Hector train siding, 20 miles west of Ludlow, CA	X	X	

b. Consultations

Although the Energy Commission has no specific regulatory obligation to consult with Native American tribes and/or individuals as a requirement under CEQA, Staff routinely consults with local Native American representatives as a matter general policy. The consultations are intended for Staff to obtain input and identify any concerns regarding potential effects to cultural resources of importance to Native Americans.

Because the proposed Calico Solar project is located on land owned by the federal government and managed by BLM, BLM took the lead in all Native American Consultation in this project in accordance with the *Memorandum of Understanding between the U.S. Department of the Interior, Bureau of Land Management, California Desert District, and the California Energy Commission Staff Concerning Joint Environmental Review for Solar Thermal Power Plant Projects* (http://www.energy.ca.gov/siting/solar/BLM_CEC_MOU.PDF).

Staff presented evidence of the following consultation efforts:

- On August 20, 2007, the BLM initiated contact with local Native American tribal organizations regarding a number of upcoming solar energy projects proposed on BLM land in the region, including the Calico Solar project. The Chemehuevi Reservation; the San Manuel Band of Mission Indians; the Colorado River Indian Tribe; and the Twenty-nice Palms Band of Mission Indians; and the Fort Mojave Indian Tribe were among the tribal organizations contacted.
- On July 22, 2008, the Applicant contacted the Native American Heritage Commission (NAHC) requesting a search of the NAHC's Sacred Lands File (SLF) to determine the presence or absence of Native American sacred sites within the project area. The response from the NAHC in July 2008 indicated that the SLF search identified no sacred sites in the project

area of analysis. The response also included a list of local Native American representatives who could be contacted regarding potential concerns or knowledge of cultural resources that could be affected by the project.

- In a letter dated November 5, 2008, the BLM initiated formal consultation with the tribes as a part of its obligation under Section 106 of the NHPA. Since that time, the BLM has maintained ongoing communications with the local tribal organizations through letters, phone calls, and meetings.

  It appears that to date, no Native American representatives have identified specific cultural resources of concern to them within the project limits; however, they have indicated an interest in the project and concerns for the resources that the Applicant has identified as being in the project area.

- On April 29, 2010, Staff attended the BLM's Cultural Resources Programmatic Agreement (i.e., possible 36 CFR §§ 800.6 or 800.14(b) agreement among agencies that include the Bureau of Land Management or other Federal agencies, and the California State Historic Preservation Officer), kick-off meeting for this project. Also present at that meeting were representatives of the San Manuel Band of Mission Indians, who expressed concerns for both cultural and biological resources that may be affected by the project.

- On June 13, 2010, Staff participated in an onsite field visit with the BLM and several members of the local Native American community including representatives of the San Manuel Band of Mission Indians; the Chemehuevi Tribe, the Twentynine Palms Band of Mission Indians; the Fort Mojave Indian Tribe, and the AhaMaKav Cultural Society. During the field visit, the participants visited selected sites and expressed interest in and concern with the cultural resources identified by the Applicant during the cultural resource inventory.

- On July 26, 2010, in follow up to the June 13, 2010, site visit, Staff attempted further contact with several tribal members. Staff's discussions with tribal members indicated that the tribes and/or members were not necessarily aware or fully informed of the other remaining archaeological sites in the project area beyond those identified on June 13, 2010.

In addition to the consultations with Native American representatives, there were consultations with other third parties. The Applicant contacted the San Bernardino County Land Use Services, City of Barstow Community Development department, and Mojave River Valley Museum to identify cultural resources

within a one-mile radius around the project footprint that had been listed pursuant to ordinance or recognized by a local historical society or museum. According to the evidence, no esponses were received from these agencies and entities.

In July and August 2010, Staff also consulted with the following organizations regarding built-environment resources: Route 66 Corridor Preservation Progam of the National Park Service; San Francisco Architectural Heritage; and the Western Regional Office of the National Trust for Historic Preservation. (Ex. 309, pp. C-2-70 to C-2-72.)

c. New Inventory Investigations

The evidence shows that several field surveys and inventories were conducted. The Applicant conducted an initial cultural resource field inventory between August 4 and October 31, 2008. Additional field surveys and more refined site recordation took place between October 2009 and March 2010. The cultural resource inventory discussed herein encompasses the initially-proposed 8,230-acre project site (the project footprint was reduced to 6,215 acres in June 2010 and reduced again in September 2010 to 4,613 acres).).

Included among the surveys was a Class III Intensive Field Survey. The pedestrian survey covered the original 8,230-acres and an additional 200 feet beyond the project site. The principal survey methods consisted of a systematic walk-over in regularly spaced parallel transect intervals. With the exception of certain caves and ridge tops situated within or atop steep terrain, the Applicant did not survey areas of steep terrain (i.e., terrain at an angle greater than 45°), where access was not feasible due to unsafe or unstable surfaces. The angle and decomposition of volcanic rocks eroding downslope in these areas, which total less than 11 acres and occur within the northeastern project area along the south-southwest facing slope of the Cady Mountains, suggest that these areas have an extremely low likelihood of containing cultural resources.

The Applicant reported that the archaeological data recorded during the Class III intensive field survey represents a preliminary in-the-field assessment based solely on observations of artifacts and other cultural components visible on the surface. (Ex. 309, p. C.2-73.). BLM Barstow archaeologist Jim Shearer provided the guidelines applied by the Applicant to field survey and its recordation of cultural resources within the Project area of analysis. Based on this guidance and previous archaeological investigations completed within or near the Calico Solar project area, the Applicant developed 14 categories of archaeological site

types that one could expect to encounter during the Class III intensive field survey and which provide a framework for the definition and documentation of resources identified in the project area. Each category type is described in the record. (Ex.1,§5.7 309, p.C-2-74 –C-2-76.)

The Applicant identified a total of 335 cultural resources, including 206 archaeological isolates, 119 archaeological sites, and 10 historic built environment resources. These resources include 12 of the 16 previously-recorded cultural resources and are specifically identifies as P-36-064407, CA-SBR-1908, CA-SBR-2910H, CA-SBR-3076, CA-SBR-4681, CA-SBR-5600, CA-SBR-5794, CA-SBR-5796, CA-SBR-6521, CA-SBR-6528, CA-SBR-6693H, and P1793-1H were relocated during filed surveys. The remaining four resources (CA-SBR-10649, CA-SBR- 1893, CA-SBR- 6511, and CA-SBR- 6520) appear to no longer exist. (Ex. 309, pp. C-2-72 to C-2-73.) (Ex. 309, pp. C-2-72 to C-2-84.)

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Each of these archaeological resources is described in **Cultural Resources Table 3** below.

Cultural Resource Table 5
Cultural Resources Inventory for the Calico Solar Project Area

Site Designation	Cultural Context	Site Taxonomy	Project Phase	Geomorphic Landform	Potential for Buried Deposits Based on Geomorphic Landform	Applicant/BLM Eligibility Recommendations
CA-SBR-1908/H UPDATE	Multi-Component Archaeological Site	Lithic Reduction Scatter Rock Cluster Features Historical Refuse Fire Affected Rocks and/or Hearths	Phase 2	Erosional Fan Remnant/Inset Fan	Very Low to Low	**Rock Feature Recommended Eligible by Applicant & BLM**; Lithic Reducion Scatter and historical refuse are Non-Contributing
CA-SBR-3076 UPDATE (EJK-021)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Relict Alluvial Flat/ Inset fan/ Axial Channel	Very Low to Moderate	Recommended Not Eligible
CA-SBR-4558H UPDATE (Logan Mine)	Historic Archaeological Site	Historical Refuse Historical Mining Site Historical Structure	Phase 1	Upper Alluvial Fan Piedmont	Very Low	Recommended Not Eligible
CA-SBR-4681/H UPDATE (RAN-102/H)	Multi-Component Archaeological Site	Complex Lithic Scatter Historical Survey/Mapping Features	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-5600/H UPDATE (RAN-189/H)	Multi-Component Archaeological Site	Complex Lithic Scatter	Phase 2	Erosional Fan Remnant/ Inset Fan/ Pisgah Lava	None to Low	Recommended Not Eligible
CA-SBR-5796 UPDATE (DRK-180)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-6521 UPDATE (RAN-115)	Prehistoric Archaeological Site	Lithic Reduction Scatter Rock Features	Phase 2	Erosional Fan Remnant/Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-6528 UPDATE (RSS-020)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-12990 (DRK-001)	Prehistoric Archaeological Site	Lithic Reduction Scatter	200 Foot Buffer	Lower Alluvial Fan Apron	Low	Recommended Not Eligible
CA-SBR-12991 (DRK-012)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 1	Lower Alluvial Fan Apron	Low	Recommended Not Eligible
CA-SBR-12992H (DRK-021H)	Historic Archaeological Site	Historical Refuse	200 Foot Buffer	Lower Alluvial Fan Apron	Low	Recommended Not Eligible

CA-SBR-13020 (DRK-173)	Prehistoric Archaeological Site	Lithic Reduction and Groundstone Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13021 (DRK-174)	Prehistoric Archaeological Site	Lithic Reduction Scatter and Possible Hearth	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13022/CA-SBR-13024 (DRK-175/DRK-177)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13025 (DRK-178)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13026 (DRK-182)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant/Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13027 (DRK-184)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13028 (KRM-002)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Upper Alluvial Fan Piedmont	Very Low	Recommended Not Eligible
CA-SBR-13029 (KRM-003)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Upper Alluvial Fan Piedmont	Very Low	Recommended Not Eligible
CA-SBR-13030 (KRM-008)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Upper Alluvial Fan Piedmont/ Lower Alluvial Fan Apron	Very Low to Low	Recommended Not Eligible
CA-SBR-13031 (KRM-024)	Prehistoric Archaeological Site	Trail	Phase 2	Lower Alluvial Fan Apron	Low	Recommended Not Eligible
CA-SBR-13032 (KRM-028)	Prehistoric Archaeological Site	Trail	Phase 2	Upper Alluvial Fan Piedmont	Very Low	Recommended Not Eligible
CA-SBR-13038/CA-SBR-13040/H (KRM-160/KRM-167/H)	Multi-Component Archaeological Site	Lithic Reduction Scatter Rock Cluster Features	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13039 (KRM-164)	Prehistoric Archaeological Site	Lithic Reduction Scatter Rock Ring Feature	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13041 (KRM-170)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13042 (LTL-008)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13044 (LTL-011)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible

CA-SBR-13045 (LTL-012)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13046 (LTL-015)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13047 (LTL-016)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13048 (LTL-017)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13049 (LTL-018)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13050 (LTL-019)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13051 (LTL-022)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Pisgah Lava	None to Very Low	Recommended Not Eligible
CA-SBR-13052 (LTL-023)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan Pisgah Lava	None to Very Low	Recommended Not Eligible
CA-SBR-13053 (RAN-011)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Upper Alluvial Fan Piedmont	Very Low	Recommended Not Eligible
CA-SBR-13054 (RAN-025)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 1	Upper Alluvial Fan Piedmont	Very Low	Recommended Not Eligible
CA-SBR-13055 (RAN-101)	Prehistoric Archaeological Site	Lithic Reduction Scatter Rock Cluster Features	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13056 (RAN-108)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13059 (RAN-114)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13060 (RAN-116)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13061/CA-SBR-13076 (RAN-118/RAN-173)	Prehistoric Archaeological Site	Lithic Reduction Scatter Rock Cluster Features Historical Refuse	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13062 (RAN-120)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13063/H (RAN-123/H)	Multi-Component Archaeological Site	Lithic Reduction Scatter Rock Cluster Features Historical Refuse	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible

CA-SBR-13064 (RAN-128)	Prehistoric Archaeological Site	Lithic Reduction Scatter Rock Cluster Features	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13065 (RAN-131)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Axial Channel	Very Low to Moderate	Recommended Not Eligible
CA-SBR-13066 (RAN-138)	Prehistoric Archaeological Site	Lithic Reduction Scatter Historical Refuse	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13068 (RAN-146)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13069 (RAN-154)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13070/CA-SBR-13067/H (RAN-155/RAN-139/H)	Multi-Component Archaeological Site	Lithic Reduction Scatter Historical Refuse Fire Affected Rocks and/or Hearths	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13071 (RAN-163)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13072 (RAN-168)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Axial Channel	Very Low to Moderate	Recommended Not Eligible
CA-SBR-13073 (RAN-169)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Lower Alluvial Fan Apron	Low	Recommended Not Eligible
CA-SBR-13074 (RAN-170)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Lower Alluvial Fan Apron	Low	Recommended Not Eligible
CA-SBR-13075 (RAN-171)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Lower Alluvial Fan Apron Axial Channel	Very Low to Moderate	Recommended Not Eligible
CA-SBR-13078 (RAN-177)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13079 (RAN-179)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13080 (RAN-180)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Axial Channel	Very Low to Moderate	Recommended Not Eligible
CA-SBR-13081 (RAN-181)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Axial Channel	Very Low to Moderate	Recommended Not Eligible
CA-SBR-13082 (RAN-183)	Prehistoric Archaeological Site	Lithic Reduction Scatter Rock Cluster Features	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13083 (RAN-186)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible

CA-SBR-13084 (RAN-188)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Erosional Fan Remnant/Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13085 (RAN-190)	Prehistoric Archaeological Site	Lithic Reduction Scatter Rock Cluster Features	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13086 (RSS-005)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13089 (RSS-009)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Axial Channel/Relict Alluvial Flat	Very Low to Moderate	Recommended Not Eligible
CA-SBR-13091 (RSS-013)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Axial Channel	Very Low to Moderate	Recommended Not Eligible
CA-SBR-13092 (RSS-014)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13093/H (RSS-017/H)	Multi-Component Archaeological Site	Complex Lithic Scatter Rock Cluster Features	Phase 2	Erosional Fan Remnant/ Axial Channel/ Inset Fan	Very Low to Moderate	**Rock Features and Cleared Areas are Recommended Eligible by Applicant & BLM;** Complex Lithic Scatter are Non-Contributing
CA-SBR-13094 (RSS-018)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13096 (SGB-013)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 1	Lower Alluvial Fan Apron	Low	Recommended Not Eligible
CA-SBR-13097 (SGB-017)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 1	Lower Alluvial Fan Apron	Low	Recommended Not Eligible
CA-SBR-13104 (SGB-041)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Upper Alluvial Fan Piedmont	Very Low	Recommended Not Eligible
CA-SBR-13105 (SGB-097)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Rock Outcrop within the Upper Alluvial Fan Piedmont	None to Very Low	Recommended Not Eligible
CA-SBR-13106 (SGB-099)	Prehistoric Archaeological Site	Lithic Reduction Scatter Fire Affected Rocks and/or Hearths	Phase 2	Rock Outcrop within the Upper Alluvial Fan Piedmont	None to Very Low	Recommended Not Eligible
CA-SBR-13107 (SGB-104)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Rock Outcrop within the Upper Alluvial Fan Piedmont	None to Very Low	Recommended Not Eligible
CA-SBR-13111 (SGB-120)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13122 (KRM-165)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible

CA-SBR-13123 (EJK-002)	Prehistoric Archaeological Site	Lithic Reduction Scatter Historical Refuse	Phase 2	Relict Alluvial Flat/Axial Channel	Very Low to Moderate	Recommended Not Eligible
CA-SBR-13124/H (EJK-004/H)	Multi-Component Archaeological Site	Lithic Reduction Scatter Historical Refuse	Phase 2	Relict Alluvial Flat/Axial Channel	Very Low to Moderate	Recommended Not Eligible
CA-SBR-13125/H (EJK-005/H)	Multi-Component Archaeological Site	Lithic Reduction Scatter Historical Refuse	Phase 2	Relict Alluvial Flat	Very Low	Recommended Not Eligible
CA-SBR-13126/ CA-SBR-5794/H (EJK-009/H)	Multi-Component Archaeological Site	Complex Lithic Scatter Rock Cluster Features Historical Refuse	Phase 2	Axial Channel/Relict Alluvial Flat	Very Low to Moderate	**Recommended Eligible by Applicant & BLM;** Parts of the Site Within the project area of analysis are Non-Contributing
CA-SBR-13349/H (RSS-006/ SGB-112/ SGB-114/SGB-118/SGB-127/H)	Multi-Component Archaeological Site	Complex Lithic and Groundstone Scatter Historical Refuse	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13441 (RAN-107/RAN-110)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13442 (DRK-133/LTL-009)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Erosional Fan Remnant/Inset Fan	Very Low to Low	Recommended Not Eligible
CA-SBR-13443/H (DRK-176/RAN-175/H)	Multi-Component Archaeological Site	Complex Lithic and Groundstone Scatter Historical Refuse	Phase 2	Axial Channel	Very Low to Moderate	**Prehistoric Component Recommended Eligible by Applicant & BLM;** Historic Component Recommended as Non-Contributing
CA-SBR-13444 (DRK-170/DRK-171)	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
CA-SBR-13445 (RSS-008/RSS-011)	Prehistoric Archaeological Site	Complex Lithic Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
DRK-S1-001H	Historic Archaeological Site	Trail	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible

DRK-S1-013	Indeterminate	Rock Cluster Feature	Phase 2		Very Low	Recommended Not Eligible
MN-S1-001	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
MN-S1-004	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
MN-S1-005	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
MN-S1-009	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
MN-S1-017H	Historic Archaeological Site	Historical Refuse	Phase 2	Axial Channel	Very Low to Moderate	Recommended Not Eligible
NOTR-PRM-S1-002/H	Multi-Component Archaeological Site	Lithic Reduction Scatter Historical Refuse	Phase 2	Erosional Fan Remnant	Very Low	Recommended Not Eligible
PRM-S1-009	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Upper Alluvial Fan Piedmont	Very Low	Recommended Not Eligible
PRM-S1-021H	Historic Archaeological Site	Rock Cluster Features Historic Survey/Mapping Features	Phase 2	Upper Alluvial Fan Piedmont	Very Low	Recommended Not Eligible
P36-014578 (RAN-035)	Indeterminate	Rock Cluster Features	Phase 2	Upper Alluvial Fan Piedmont	Very Low	Recommended Not Eligible
P1793-1H (RAN-050/H)	Multi-Component Archaeological Site	Historical Refuse	Phase I	Axial Channel	Low	Recommended Not Eligible
SM-S1-001	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible
SM-S1-003	Prehistoric Archaeological Site	Lithic Reduction Scatter Fire Affected Rocks and/or Hearths	Phase 2	Inset Fan/Erosional Fan Remnant	Very Low to Low	Recommended Not Eligible
SM-S1-005	Prehistoric Archaeological Site	Lithic Reduction Scatter	Phase 2	Inset Fan	Very Low to Low	Recommended Not Eligible

As shown, the archaeological sites comprise 94 prehistoric sites, eight historic-era sites, 15 multi-component sites (containing both prehistoric and historic-era components), and two rock cluster feature sites of indeterminate age.

In summary, results of the Applicant's investigation show the overall potential for buried archaeological resources to occur in the project area ranges from very low to moderate, depending on the underlying landform and the degree of desert pavement stabilization present on the project site. "Desert pavement" is defined

in the Applicant's analysis as a desert surface covered with closely packed, interlocking angular or rounded rock fragments of pebble and cobble size.

Staff provided further explanation of the Applicant's results. (Ex. 309, pp. C.2-84 — C.2-87.) According to Staff, it appears that the less stable or poorly developed desert pavement surfaces exhibit more sediment visibility and are therefore more likely to contain buried archaeological deposits. (As shown, the archaeological sites include 94 prehistoric sites, eight historic-era sites, 15 multi-component sites (containing both prehistoric and historic-era components), and two rock cluster feature sites of indeterminate age. And, although a well-formed desert pavement does not preclude the existence of a buried component to a site located on that pavement, it does significantly decrease the likelihood that a buried archaeological deposit not already evident on the surface is buried below it.

The majority of archaeological sites identified during the survey were found in the southern portion of the project area where the land surface is covered by varying degrees of desert pavement. These areas contain an abundance of naturally occurring cryptocrystalline silicate materials such as chalcedony and jasper, which are suitable for the production of flaked stone tools. Thus, the locations of the prehistoric sites observed within the project study area appear to be largely dictated by the availability of these lithic raw materials that are constituents of the desert pavements. (Id.)

Furthermore, according to the Applicant's study, the most likely sources for buried archaeological deposits within the archaeological sites are the Holocene alluvial deposits within and adjacent to the landform identified as the east-west Axial Channel. The Channel is in the southern portion of the project area. Archaeological sites identified along this drainage contain a variety of artifact types, including groundstone and other indications of, at the least, food processing localities. The loose sandy matrix and the seasonal rain and flood events are likely to have obscured portions of these deposits. (Id.)

The Applicant's survey and prior research in the Calico Solar project area revealed 21 temporally diagnostic prehistoric artifacts (one of which was previously collected in 1990 for a different project), which indicate a broad time span of regional site use. Of the total temporally diagnostic artifacts in the project area, 18 occur at archaeological sites and three are isolated finds. The record identifies each artifact. (Exs. 309, p. C.2-87, -

d. Built Environment Survey

On August 19 and October 27 through 28, 2008, the Applicant conducted a historic built environment field survey within the project footprint and a one-half-mile built-environment buffer. The Applicant focused on properties that appeared older than 45 years and evaluated them under NRHP and CRHR eligibility criteria.

The Applicant also conducted site-specific and general primary and secondary research using SBAIC/CHRIS and university resources, and initiated contact with entities that included but were not limited to the San Bernardino County Land Use Services, City of Barstow Community Development Department, and the Mojave River Valley Museum, and SCE. The Applicant also obtained and reviewed historic maps including 1955 15-minute U.S. Geological Survey quadrangles, five maps depicting the Old National Trails Highway, *Punnett Brothers Map of San Bernardino County* (1914), *Kremmerer's map of San Bernardino County* (1925), and *Thomas Brothers Settlers* and *Miner's Map of San Bernardino County* (1932). (Ex. 309, pp. C-2-87 – C-2-88.)

As a result of its surveys, the Applicant identified 10 built-environment resources older than 45 years. The properties are identified in **Cultural Resources Table 4** below. (Ex. 309, pp. C.2-89 – C-2-90.)

Cultural Resources Table 4:
Built-Environment Resources within the Calico Solar Project Area

Trinomial	Resource Name	Year Constructed	Description of Resource	Recommended Eligible by Applicant	Location
CA-SBR-2910H	National Old Trails Road	1912	remnants of historic road	No	Phase 2 and one half-mile buffer
CA-SBR-2910H	U.S. Route 66	1930s	historic highway	No/Yes (conflicting recommendation)	One half-mile buffer
CA-SBR-6693H	Atlantic & Pacific Railroad/Atchison, Topeka, & Santa Fe Railroad	1882-1883	historic railroad and associated bridge structures	Yes	One half-mile buffer
CA-SBR-13114H	SCE 12-kilovolt power line	1961	pine T-post utility pole transmission line	No	One half-mile buffer

Trinomial	Resource Name	Year Constructed	Description of Resource	Recommended Eligible by Applicant	Location
CA-SBR-13115H	SCE 220-kilovolt North Transmission Line	1936-1939	single-circuit, steel lattice tower transmission line	Yes	One half-mile buffer
CA-SBR-13116H	SCE 220-kilovolt South Transmission Line	1939-1941	single-circuit, steel lattice tower transmission line	Yes	One half-mile buffer
CA-SBR-13117H	Pisgah Substation	1940	SCE switching station including switch gear, bus bars, and 3 structures used for relay and station battery equipment and storage	Yes	One half-mile buffer
CA-SBR-13118H	Hector Road	late 1930s to early 1950s	one-lane, graded dirt road	No	Phase 1 and Phase 2
CA-SBR-13119H	Pisgah Crater Road	late 1930s to early 1950s	asphalt paved road	No	One half-mile buffer
N/A	Pacific Gas and Electric Pipeline	prior to 1955	natural gas pipeline	Exempt under Sec. 106. Not evaluated – no effect.	Phase 2 and one half-mile buffer
N/A	Mojave Pipeline	prior to 1955	natural gas pipeline	Exempt under Sec. 106. Not evaluated – no effect.	Phase 2 and one half-mile buffer

Key:
SCE- Southern California Edison

* Both the National Old Trails Road and 1930s alignment of U.S. Route 66 have been recorded under site number CA-SBR-2910H. Because remnants of both the 1912 alignment of the National Old Trails Road and the 1930s alignment of U.S. Route 66 are located within the Project area of analysis, these resources are listed separately and separate update forms were completed.

6. Historical Significance of Archaeological Resources

a. Individual Prehistoric Archaeological Resources

Staff testified that the Applicant's data regarding available prehistoric archaeological resources is not sufficiently refined to inform an adequate evaluation of the significance of these resources. According to Staff, the data potential of the prehistoric resources within the project area of analysis was not exhausted through recordation and additional investigation is warranted to more

definitively draw conclusions regarding archaeological site significance. (Ex. 309, p. C-2-91.)

BLM revisited seven of the 119 archaeological sites identified by the Applicant. These sites appear to have been selected on following criteria: (1) the types of surface artifacts observed during site recordation (all sites are classified as *Complex Lithic Scatters,* with the exception of one); (2) the location of the sites in proximity to the Axial Channel/Inset Fan (which is considered to have a moderate sensitivity for subsurface archaeological deposits per the geoarchaeological analysis); 3) the presence of rock cluster features or potential hearths (because the rock cluster features are indeterminate and have not been formally evaluated, the BLM is assuming them to be eligible for the NRHP); and (4) the low degree of desert pavement development reported during the Applicant's site recordation.

Although BLM did not prepare a formal report of its investigation, it submitted informal data to Staff. BLM's activities and conclusions regarding the seven sites are summarized as follows:

- CA-SBR-13126/H – BLM excavated five "post-holes" (11-inch diameter) to a depth of 70 centimeters. No cultural artifacts or organic staining (midden) were observed from the post-hole excavation, but subsurface remains may exist in the portion of the site that lies outside the project area of analysis to the west. BLM determined that the portion of the site within the project area of analysis is not eligible for nomination to the NRHP.
- CA-SBR-13443/H – One "post-hole" (11-inch diameter) was excavated to a depth of 70 centimeters. In-situ fire-affected rock was recovered from 50 to 70 centimeters below the surface. BLM concluded that subsurface cultural remains exist in at least one portion of the site that also has groundstone and flaked stone assemblages on the surface. BLM further determined that this site is eligible for nomination to the NRHP.
- CA-SBR-13093/H –BLM determined, without engaging in subsurface testing, that the portion of this resource that contains 37 rock cluster features, is eligible for nomination to the NRHP. However, it also determined that the remaining portions of the site, which contain complex lithic scatter loci, are non-contributing elements to the rock features and are, therefore, not eligible for nomination to the NRHP.
- CA-SBR-1908/H – BLM determined, without engaging in subsurface testing, that the portion of this resource that contains 498 rock cluster features is eligible for nomination to the NRHP. BLM has also determined

that the remaining portions of the site, which contain lithic reduction scatter loci, are non-contributing elements to the rock features and are, therefore, not eligible for nomination to the NRHP.

- CA-SBR-13075 – The Department of Parks and Recreations (DPR) site form prepared by the Applicant indicated that there was a near absence of well-developed desert pavement surface. BLM concluded that the site is covered by "moderate desert pavement development." On this basis and without engaging in subsurface testing, BLM concluded that there is no potential for subsurface cultural artifacts and, therefore, determined that the site is not eligible for nomination to the NRHP.
- CA-SBR-13007 – The DPR site form prepared by the Applicant indicated that the soils throughout the site show no development of desert pavement. BLM concluded that the site area is covered by "moderate desert pavement development that has been disturbed throughout by braided slope erosion." On this basis and without engaging in subsurface testing, the BLM concluded that there is no potential for subsurface cultural artifacts to occur at this site and, therefore, determined that the site is not eligible for nomination to the NRHP.
- CA-SBR-6528 – The DPR site form prepared by the Applicant indicated that ten of the 27 loci are on poorly developed desert pavement surfaces, one is on loose sands with no desert pavement, and the rest are on moderately to well developed desert pavement. BLM concluded that "the site area is covered by low to moderate desert pavement development." On this basis and without engaging in subsurface testing, BLM concluded that there is no potential for subsurface cultural artifacts to occur here and, therefore, determined that the site is not eligible for nomination to the NRHP.

Thus, based on its own investigation, BLM determined that three of the 119 archaeological sites in the project area of analysis are eligible for nomination to the NRHP (CA-SBR-13126/H, CA-SBR-13443/H, and CA-SBR-13093/H), discussed above,) (Ex. 309, pp. C-2-91 – C-2-92.)

With respect to the remaining 116 sites, the Applicant applied NRHP and CRHR eligibility criteria to each one and recommended that all are ineligible for NRHP and CRHR. (Ex. 309, p. C-2-92.) The Applicant's rationale is presented in the record. (*Id*.)

Guided by concerns about project impacts to biological and cultural resources, the Applicant reduced the original 8,230-acre footprint to 6,215 acres and reconfigured the portions of the southern project area to avoid all or portions of the three archaeological sites identified as NRHP eligible. (Ex. 57 More specifically, CA-SBR-13443/H has been entirely excluded from the project area and the majority of the two other sites (i.e., the portions containing the rock cluster features), CA-SBR-1908/H and CA-SBR-13093/H, have also been excluded from the project footprint. In September 2010, the project site was reduce again to 4,613 acres. Only the "non-contributing" (lithic scatter) portions of these two sites remain within the project area of analysis. (Ex. 309, pp. C.2-91 – C.2-93.)

Ten additional archaeological sites are now also excluded from the project footprint based on the alternative project layout. These sites were in close proximity to the site areas targeted for avoidance and/or proximity to biological resources being avoided, The ten additional archaeological sites now wholly excluded from the project footprint include: CA-SBR-4558H; CA-SBR-13013; CA-SBR-13028; CA-SBR-13029; CA-SBR-13030; CA-SBR-13054; CA-SBR-13105; CA-SBR-13107; P36-014578; SM-S1-005. A portion of site CA-SBR-13126/H is now also excluded from the project footprint. (Ex. 309, p. C.2-93.)

Thus, 108 archaeological sites are currently entirely or partially within the most recent proposed project footprint and would be directly affected by the project. Among the 108 remaining archaeological sites, 100 are prehistoric sites (14 of which are multi-component sites with a minor historic component), seven are historic sites, and one is indeterminate.

Based on the evidence as just summarized above, the Applicant has recommended, and the BLM has determined, *based on surface observations*, that the data potential has been exhausted through recordation for all 108 archaeological sites within the project current footprint and those sites are, therefore, not eligible for nomination to the NRHP or CRHR. (Ex. 309, p. C.2-93.)

Despite the Applicant's and BLM's investigatory efforts, we are unable to conclude that all potentially significant datasets have been identified and that representative samples of archaeological data potential have been exhausted through recordation for the 100 remaining prehistoric archaeological sites in the project area. Staff submitted evidence underscoring the necessity of further study. (Ex. 309, pp. C.2-93 – C.2-96.) We are particularly persuaded by Staff's contention that the Calico project area is compelling in that: (1) a large number of

formed artifacts were reported in the DPR forms for the sites in the project area; (2) because the project will be on public land, there is a high likelihood that unauthorized artifact collection (i.e., looting) has occurred in the project area, which may have skewed the surface visibility of lithic materials (particularly diagnostic artifacts) and correspondingly, any conclusions drawn about the sites based on surface observations alone; (3) the geology of the area is such that a sizable expanse of toolstone-quality material was available and actively exploited by prehistoric inhabitants over an apparently broad expanse of time, and the sites' constituents reflect the importance of lithic raw material procurement and initial treatment activities; and (4) while the project area of analysis was predominantly a lithic raw material procurement/assaying area, there is also evidence of other activities beyond primary lithic reduction (e.g., secondary/tertiary lithic reduction, late-stage bifacial tools, fire-affected rock, and groundstone artifacts).

Furthermore, the sites in the project area suggest that activities were not limited to basic toolstone procurement. (Ex. 309, pp. C-2-95 to C-2-96.) Thus, given the size and quantity of the pavement quarry area, attempts to more accurately characterize the technology and reduction organization through further study of the sites prior to their permanent destruction by the project's construction are warranted to more precisely determine archaeological site significance. (Ex. 309, pp. C-2-94 – C-2-96, C-2-100, 8/18/10 RT 418-426.) We have adopted Conditions of Certification **CUL-4** and **CUL-5** to accomplish this.

b. Prehistoric Archaeological Landscape

The Applicant and BLM on the one hand and Staff on the other hand, presented different characterizations of the project area landscape. (Ex. 309, pp. C-2-96 to C-2-100.) In Staff's view, the potential prehistoric archaeological landscape is a subtle but potentially significant resource that may reflect underappreciated patterns of prehistoric land use that were important to the economy and to the maintenance of the regional social fabric during particular periods in prehistory. The landscape retains sufficient integrity to convey this significance. As explained by Staff, the landscape has potential to provide information necessary to the reconstruction of those economic and social patterns, and may also provide information important to the reconstruction of toolstone acquisition and lithic production trajectories in prehistory. Staff is therefore concerned that the project would permanently destroy a large portion of a prehistoric archaeological landscape that may exist on the project site. (Ex. 309, p. C-2-96.)

In contrast, the Applicant and BLM argue against the significance of the landscape. The Applicant agrees that bolson in which the project area of analysis is situated can be characterized as an archaeological landscape, but suggests that in terms of a definable geographic area that can be distinguished from surrounding properties by changes such as density, scale, type, age, or style of sites, rich sources of tool stone are not confined to the project area, nor are they unique. As a result, the tool stone source and landscape is not well bounded and that similar formations occur throughout the southern California deserts that were used prehistorically.

The Applicant further asserts that the characteristic theme of the archaeological landscape cannot be dated and does not have the distinctive or significant qualities required for eligibility under Criterion C/3. In addition, the lack of datable material at the sites within the project area precludes their consideration for eligibility under Criteria A/1 and B/2, as both criteria require information – which is not known -that could link the landscape with particular events and trends, or with historically significant people. The Applicant also asserts, based on underlying data that the lithic reduction sites and landscape do not have sufficient data potential to qualify for listing under Criterion D/4.

We find that the evidence shows that the project may result in the permanent loss of important prehistoric landscape and this impact would be significant. (Ex. 309, pp. C-2-96 – C-2-102.) We concur with Staff's recommendation that the preparation of carefully crafted protcols is required before the start of ground disturbance. These protocols shall facilitate the gathering and analysis of information to further refine the assessment of the historical significance of the archaeological resources in the project areas. We have adopted Condition of Certification **CUL-4** to require the project owner to prepare the protocols subject to a suite of specified criteria and standards. Subsequent to the completion of the implementation of each protocol, the project owner must prepare and submit for the review and approval of the Compliance Program Manager, separate reports on the results of the implementation of each protocol, on the analysis and interpretation of that data, and on the CRHR evaluation of the resource type, type group, or large-scale resource that a subject protocol addresses.

Meaningful testimony was presented by Staff, BLM and intervenor California Unions for Reliable Energy (CURE) regarding the proposed design and methodology for retrieving the data contemplated by Condition of Certification **CUL-4**. (8/25/10 RT 21-71.). While Staff, BLM, and the SHPO (by way of written correspondence) were in general agreement that some form of mechanical

excavation would be appropriate, CURE submitted an opposing view. According to the testimony of CURE witness Dr. David Whitley, hand excavation is the only acceptable method in this case (8/25/10 RT 62-71). Dr. Whitley was also concerned that the criterion for eligibility for the subject sites is going to be based primarily on whether subsurface archaeological deposits are present or are not present. In his view, this is unsatisfactory as there are many examples of archaeological sites that have provided very important scientific information even though they are surface archaeological manifestations. (Id.) We have considered the evidence and testimony and are persuaded that the proposed design and methodology as set forth in **CUL-4** are appropriate and adequate for this project.

And, with implementation of Condition of Certification **CUL-5**, the project owner, prior shall – before the start of ground disturbance - submit a Cultural Resources Monitoring and Mitigation Plan (CRMMP), to the CPM for review and approval. The CRMMP shall be prepared by or under the direction and shall identify general and specific measures to minimize potential impacts to sensitive cultural resources.

In combination, these Conditions would address questions pertaining to the eligibility of the prehistoric sites within the project area and would provide for mitigation for any significant impacts, should any of the sites be determined eligible for the NRHP or CRHR.

c. Historical Archaeological Resources

After the Applicant reduced the project footprint from 8,230-acres to the current 6,215 acres, the total number of historical archaeological sites within the project area of analysis was reduced to 19 sites. Among these 19 sites, 16 are comprised of historical refuse deposits consisting of a sparse distribution of domestic, commercial, construction, or industrial debris (e.g., cans, bottles, ceramic tableware, milled lumber, machinery, and appliances) that predates 1963. The three remaining sites consist of a survey/mapping feature, mining remains, and a trail, respectively. In September 2010, the project site was reduced again to 4,613 acres to address biological resources concerns associated with the northern portions of the site.

The Applicant applied the NRHP and CRHR criteria to each of the historical archaeological sites and does not recommend any for NRHP or CRHR eligibility. According to the Applicant, (1) the sites are not associated with events that have made a significant contribution to the broad patterns of the history and cultural

heritage of the United States or California (Criterion A/1); (2) the sites are not associated with the lives of persons significant to the nation's or California's past (Criterion B/2); (3) the sites do not embody distinctive characteristics of a type, period, region, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction (Criterion C/3); and (4) based on the geology of the sites, there is low likelihood of buried archaeological remains. Thus, according to the Applicant, research potential of the 19 sites has been exhausted through recordation and they are not likely to yield information important to the prehistory or history of the nation or of California (Criterion D/4). (Ex. 309, pp. C.2-101 – C.2-102.) Based on its own review of the site information, Staff concurs that these 19 historical archaeological sites/components within the project area are not eligible for the NRHP or CRHR. We find that the evidence supports the Applicant's and Staff's conclusions.

7. Historical Significance of Built-Environment Resources

As discussed above, the historic built environment survey identified 10 resources within the project area of analysis. The Applicant recommends the following five of the historic built resources within the project area of analysis as eligible for listing on the NRHP and CRHR:

National Old Trails Road (CA-SBR-2910H)

Within the project area of analysis, the National Old Trails Road consists of eight remnant segments of a batched mix oil road. The condition of the road segments is poor. Most of the road surface is crumbled, cracked, and has eroded away in places. Some segments are buried in sand, but may be partially intact.

Based on the historic context and evaluative considerations for NRHP and CRHR eligibility as discussed above, the portions of Old National Trails Road in the project area of analysis would not be considered a contributing element to the potential significance of the entire Old National Trails Road alignment or considered an individually significant segment of Old National Trails Road.

For instance, within the six-mile segment of the roadway within the project area, there are no standing structures or architectural properties associated with Old National Trails Road, such as businesses, roadside attractions, automobile courts, and so on. Nor are there properties within the project area associated with the theme of automobile transportation in the Old National Trails Road era.

Further, the portion of the former roadway within the project area does not reflect any important trend or accomplishment associated with road engineering, highway design, or construction and there are no major or significant erosion-control features or landscape modifications within the segment. Distinctive engineering features are lacking and the general feeling of the open roadway within the desert in this segment has been affected by the modern non-historic visual and atmospheric intrusions, such as the multi-lane Interstate 40, wooden and metal lattice tower power lines, transmission lines, and a fairly large electrical substation with associated infrastructure.

These intrusions have diminished the property's visual narrative, context, and feeling. This portion of Old National Trails Road is not contiguous with rest of the Old National Trails Road/U.S Route 66 system, and is not associated with events which reflect the important land use activities, traditional cultural activities, and development that has characterized (and is important) to San Bernardino County, California, and the nation. There are no important people or events associated with this segment of the roadway. In addition, the property does not have the potential to yield important information.

The Applicant concluded that the portion of Old National Trails Road within the project area of analysis does not appear to be a contributing element to the significance of the entire National Old Trails Road/U.S. Route 66 system. And, therefore, it does not appear to be individually eligible for the NRHP, CRHR, or considered a historical resource for purposes of CEQA.

Staff performed an independent evaluation of this segment and similarly concluded that it does not appear to possess sufficient historic integrity of setting, feeling, materials, workmanship, and association to be considered eligible for listing to the NRHP, CRHR, or considered a historical resource for purposes of CEQA. Staff further determined that the addition of a solar plant near the roadway would not create a new adverse effect or significant impact to the portion of the historic-period property within the project area.

We find that the evidence presented supports the conclusions reached by the Applicant and Staff. (Ex. 309, pp.C.2- 102 - C.2-104.)

U.S. Route 66 (CA-SBR-2910H)

The Applicant evaluated the eligibility of the segment of Route 66 in the project area of analysis: Applicant identified eligible Route 66 resources to include individual properties such as motels, gas stations, restaurants and cafes, and

roadside attractions that may be individually eligible for listing on the NRHP. In order to be eligible as a Route 66 resource, a resource must be able to reflect its association with the theme of automobile transportation in the Route 66 era.

Guided by eligibility criteria, the Applicant initially determined that that the portion of Route 66 within the built-environment area of analysis does not appear to be a contributing element to the significance of the entire U.S. Route 66 system, and the segment within the one-half mile built-environment area of analysis does not appear to be individually eligible for the NRHP, the CRHR, and would not be considered a historical resource for purposes of CEQA. (). However, at Staff's request, the Applicant considered whether three historic districts should be defined within the area of analysis, including a "National Old Trials Road/U.S. Route 66 Historic District." As part of this evaluation, the Applicant concluded that the segment of U.S. Route 66 in the project area of analysis retains historical integrity and is considered eligible. This revised conclusion caused Staff to further research the history, context and character-defining features of U.S. Route 66. (Exs., 309, pp. C-2-104 to C.2-106).

The record discloses Staff's independent evaluation of this segment of Route 66. Unlike the Applicant who appeared to focus primarily on the architecture that resulted from the establishment of Route 66 as a major travel route, Staff considered the significance of Route 66 itself as a national highway. In so doing, Staff consulted and presented evidence of the Route 66 Corridor Preservation Program, established by National Park Service as a result of *Public Law 102-400, the Route 66 Study Act of 1990*. This reference notes the significance of Route 66 as the nation's first all-weather highway linking Chicago and Los Angeles and described in some detail, hallmarks of Route 66 including its symbolizing the optimism that pervaded the nation's post World War II economic recovery. According to the evidence, the Route 66 Corridor Preservation Program commissioned the *Route 66 Corridor National Historic Context Study,* published in 2004, which details the national significance of Route 66, identifies the period of significance (1926-1970), and identifies the historic and architectural property types associated with it. The *Route 66 Corridor National Historic Context Study* also identifies those features that a road segment must retain in order to be considered eligible, including the original cross -section template (cut banks, fill slopes, roadbed, grade); original alignment or later realignment; and associated features such as bridges and culverts (even if they have been modified or replaced). The context study also states that those segments of road that have been widened after the end of the period of significance may still be included if they link other significant sections of the

route, and, notably, that pavement is “an inherently fragile feature of highways and is routinely covered over and replaced.” (Ex. 309, pp. C-2-106 – C-2-108.)

Staff applied the information from the *Route 66 Corridor National Historic Context Study* to Route 66 as described in the original evaluation in the project area of analysis. Staff determined that this section would be a contributor to a larger U.S. Route 66 historic district, should such a resource be determined eligible, and that this section would therefore be considered a historic resource for the purposes of CEQA based on factors such as the section of roadway being pristine; it is a realigned section of the road to reduce sharp turns, steep grades and accommodate higher speeds. And, while there is evidence that the road has been resurfaced and widened since its construction at undetermined times, Staff posits that these changes took place within the identified Route 66 period of significance 1926-1970 to accommodate modern traffic. (*Id*.)

This section of road also retains those character-defining eligibility features noted in the *Route 66 National Historic Context Study:* the original cross-section template, later (1934) realignment, and four associated single-span bridges that were constructed from 1939 to 1952. These bridges retain features that indicate they are likely original features of Route 66, including the concrete decking, and are in good state of preservation. (*Id*.).

Staff produced evidence that the Southern California Edison (SCE) 220-Kilovolt North and South Transmission Lines and the Pisgah Substation were all constructed between 1936 and 1941, beginning only two years after the construction of Route 66 in 1934. Interstate 40 was constructed in 1968, also within the national period of significance. The SCE 220 kV lines and the Pisgah Substation have been determined to be NRHP- and CRHR-eligible resources for their association with the Hoover Dam and their significance in the World War II effort (Criterion A/1). These resources would have been part of the Route 66 travel experience and landscape across this section of the Mojave Desert, and therefore would not compromise the integrity of Route 66. (*Id.*)

Staff’s reported consultation with the Route 66 Corridor Preservation Program further underscores Staff’s position that rural sections of Route 66, such as that found in the project area and in the eastern Mojave Desert in general, are particularly significant for the vast, open landscapes and viewsheds. Those landscapes and viewsheds are considered character-defining features of the travel experience of Route 66. The consultation further informed Staff that the project area is included in the proposed Mojave Trails National Monument

currently being heard by Congress, one purpose of which is the preservation of Route 66 (http://www.opencongress.org/bill/111-s2921/text). (*Id*.)

In light of the evidence presented, we concur with Staff's determination that the portion of Route 66 within the project area of analysis contributes to the significance of Route 66, is potentially eligible for the NRHP and CRHR as a contributing resource to the larger Route 66 system under Criterion A/1 for its association as one of the first all-weather highways in the United States, and is therefore it is a historical resource for the purposes of CEQA.

Atlantic & Pacific/Atchison Topeka & Santa Fe Railroad (CA-SBR-6693H)

SBR-6693H is the railroad line that was originally built in 1883 for the Atlantic and Pacific Railroad Company. From 1890, the railroad was operated by the Atchinson, Topeka & Santa Fe Railroad until its merger in 1996 with the Burlington Northern Santa Fe Railway (BNSF). Between 1993 and 2002 portions of this site (none within the project area) have been given status codes 2S2 (individual property determined eligible for the NRHP by a consensus through Section 106 process; listed in the CR) and 6Y (determined ineligible for NR by consensus through Section 106 process, not evaluated for CR or Local Listing). SBR-6693H bisects the project area and is located within both phases of project construction.

The BNSF Railway is located within the one-half mile built-environment area of analysis. In addition to the railroad track, associated historical artifacts include glass, metal, track and train parts, and railroad tableware. The railroad has been previously determined to be eligible for the NRHP and the CRHR under Criterion A (Criterion 1) for its association with the history of transportation in California.

Although much of the railroad has been upgraded for continued use and few historical materials remain in place, the Applicant states that it retains integrity of location and the level of significance established by the previous recordings. However, we agree that the evidence presented by Staff showing that the replacement of railway and bridge historic materials with modern materials and the resulting loss of integrity do not support a recommendation of NRHP or CRHR eligibility for the BNSF Railway and five bridge structures within the project buffer. (Ex. 309, pp. C-2-109 to C-2-110.)

Southern California Edison 12-Kilovolt Transmission Line (CA-SBR-13114H)

The SCE 12-kilovolt transmission line was constructed in 1961 as a rural distribution line. The line within the project area of analysis consists of fifteen 40-

foot-tall utility poles, which are each 0.75 foot in diameter. The poles have a single T-post on the top with 3 ceramic insulators and 3 transmission lines. The poles are creosote-treated pine and each pole features an identification tag and an embossed nail on the left for height (40) and an embossed date nail (61) on the right. There also is an associated 207-foot-long historic transmission road and sparse historic trash in the vicinity of the transmission line.

The evidence shows that the 12-kv transmission line is not associated with any distinctive or significant event, persons design or construction, and all data potential has been accounted for during the recordation process. Thus, we concur that based on site investigations and historic research, the SCE 12-kilovolt transmission line is recommended not eligible for the NRHP or the CRHR under any of the criterion for eligibility, and there is not a historic resource pursuant to CEQA. (Ex. 309, p. C-2-110.)

Southern California Edison 220-Kilovolt North and South Transmission Lines (CA-SBR-13115H and CA-SBR-13116H)

The SCE 220-kilovolt North and South Transmission Lines are single-circuit transmission lines with lattice steel, wedge A-frame and metal-waisted tower structures. The evenly-spaced tower structures are approximately 75-feet-tall and include 3 conductor wires, 2 static wires, and insulators. The transmission lines originate at the SCE switchyard at the Hoover Dam and terminate in Chino, California.

Two approximately 4.7-mile-long segments of the transmission lines were recorded within the historic built-environment one-half mile project area of analysis. Within the project area each tower structure has four legs, which are anchored in concrete footings. The transmission lines are located in a rural setting on property managed by the BLM.

The SCE 220-Kilovolt North Transmission Line was constructed between 1936 and 1939, using the same design and technology SCE had been using for its existing high-voltage transmission lines in southern California (including its Vincent 220-kilovolt line), and the design used by the Metropolitan Water District for its Hoover Dam line. The transmission line began receiving power from the Hoover Dam in 1939, after the completion of Hoover generating units A-6 and A-7 (Myers 1983; Schweigert and Labrum 2001). When World War II began in Europe, SCE planners anticipated an increase in demand for power in southern California. SCE began construction on a second transmission line, the SCE

South 220-Kilvolt South Transmission Line (SCE South or Hoover-Chino No. 2), in 1939.

The lines are associated with the early operation of Hoover Dam and both played a significant role in providing electricity essential to World War II industries located in southern California. Both lines were previously recorded in Nevada (site numbers 26CK6249 and 26CK6250) during the Boulder City/U.S. 93 Corridor Study, and were determined eligible for the NRHP by the Federal Highway Administration and Nevada State Historic Preservation Office (Federal Highway Administration 2005).Furthermore, both lines are in-use and regularly maintained in the project area.

The evidence also establishes that the lines retain sufficient integrity to be considered for listing on the NRHP and CRHR. (Ex. 309. pp. C-2-110 to C-2-112.)

Pisgah Substation (CA-SBR-13117H)

The Pisgah Substation is a Southern California Edison switching station that was constructed in 1940 during the construction of the SCE South 220-Kilvolt South Transmission Line and is considered a component of the transmission line. A switching station is an intermediate station, which has incoming and outgoing power lines of the same voltage. Unlike other substations, a switching station does not transfer power from a higher voltage to a lower voltage, but instead works to control increases and decreases in voltage. The Pisgah Substation also has three buildings, which house the relay station and battery equipment. All of the buildings are in good condition and appear to be in-use.

The evidence shows that the Pisgah Substation is not associated with distinctive or significant person, is typical of the design of its era, and is not considered a rare surviving example of its era. However, this switching station is associated with the Southern California Edison 220-Kilovolt North and South Lines, which – as discussed above -are recommended eligible for the NRHP and CRHR under Criteria A/1. Because the Pisgah Substation is a component of the transmission line, it is appropriate for an NRPH or CRHR eligibility recommendation under Criterion A/1. It is also appropriately characterized as a historic resource under CEQA. (Ex. 309, pp. C-2-112 to C-2-113.)

Hector Road (CA-SBR-13118H)

Four segments of Hector Road were recorded within Phase 1 and Phase 2 of the project area of analysis. The Hector Road interchange on I-40 provides access to

the project area of analysis. South of the interchange, Hector Road is a two-lane paved roadway that extends south for a short distance to U.S. Route 66. North of the Interstate 40 interchange, Hector Road is reduced to one-lane, graded, dirt roadway. This segment of the roadway has been realigned since its original construction, and much of the historic segment of the road between Interstate 40 and the BNSF is not within the project area of analysis. An improved railroad crossing has been constructed at Hector Road, which remains locked with a gate and padlock and is only used by local traffic with access permission. The improved crossing includes crossing arms and slightly sloped asphalt ramps that bring the road up to railroad grade and back down to road grade level.

From the BNSF Railroad, Hector Road continues northward about one mile to the northwest corner of Section 3, Township 8 North, Range 6 East, and then continues eastward along the section line for three miles. At the northeast corner of Section 1, Township 8 North, Range 6 East, Hector Road turns to the southeast and continues across sections 6 and 8 until its junction with the SCE 220-kV transmission line road. This segment of the road is a one-lane, graded dirt road that appears to be maintained and frequently used. The route of Hector Road from the railroad to the transmission line road has not been modified since its original construction in the late 1930s or early 1950s. Sometime after 1955, Hector Road was extended about one-half mile southeast to a road that leads to the Black Butte manganese mine. Hector Road likely was constructed to provide access to mines in the Project vicinity. The road also could have been used to transport construction materials to the SCE 220-kV transmission line and the Pisgah Substation from the railroad.

According to the evidence, Hector Road is a modest example of a typical one-lane dirt graded rural road. It is not associated with any distinctive or significant events, persons, design/construction, or has the potential to yield important information about the past. The road is representative of typical construction, which has been well-documented in California and the West. Thus, we concur with the Applicant's and Staff's respective conclusions as supported by on site investigations and historic research, that Hector Road is not eligible for listing in the NRHP and CRHR, and would not be considered a historic resource pursuant to CEQA. (Ex. 309, p. C.2-113.)

Pisgah Crater Road (CA-SBR-13119H)

Pisgah Crater Road currently runs between the SCE 220-kilovolt transmission line road to the Pisgah Crater, a volcanic cinder cone located south of the project area of analysis. U.S.G.S. 15-minute topographic quadrangles indicate that this

road was extended sometime after 1955 because the map only depicts the road between Pisgah Crater south of U.S. Route 66 and a small segment north of U.S. Route 66 that terminates at the BNSF Railway. The segment of Pisgah Crater Road that is 45 years old or older is paved with asphalt and is approximately 24 feet wide.

The Pisgah Crater currently is being mined for aggregate and is located on private land. The road does not appear to be regularly maintained and likely is only sporadically used to access the mine.

The evidence indicates that Pisgah Crater Road is not associated with any distinctive or significant event, person, design, or construction, and the data potential has been accounted for during the recordation process. The majority of the road is located on private land and much of the crater has been destroyed by mining.

As further explained by Staff, no records were found to indicate that the Pisgah Crater was ever a well-known tourist destination for U.S. Route 66 travelers. The road is representative of typical construction and design, which has been well-documented in California and the west, and further study, is unlikely to yield important information about the past.

We therefore find that Pisgah Crater Road is not eligible for listing in the NRHP or the CRHR and is not a historical resource pursuant to CEQA. (Ex. 309, pp. C.2-113 to C.2-114.)

Pacific Gas and Electric and Mojave Pipelines

The Pacific Gas and Electric Pipeline and the Mojave Pipeline are natural gas pipelines constructed before 1995 that run through the Phase 2 portion of the project area. According to the evidence, there are no visible features of either pipeline in the project area. In addition, the Advisory Council on Historic Preservation has exempted federal agencies from taking into account the effects of their undertakings on historic natural gas pipelines (Advisory Council on Historic Preservation 2002). Thus, the pipelines appear are ineligible for NRHP or CRHR under any criteria. PR 523 forms were not completed for either pipeline. (Ex. 309, p. C-2-114.)

8. Ethnographic Resources

There are no known ethnographic resources within the footprint or viewshed of the proposed project area. (Ex. 309, p. C.2-115.)

9. Historic Districts and Landscape Considerations

Southern California Edison Historic District

Resources that could be included in the potential SCE Historic District are the SCE 220-kV North and South Transmission Lines (CA-SBR-13115H and CA-SBR-13116H), Pisgah Substation (CA-SBR-13117H), and archaeological site CA-SBR-12992H.

As discussed above, the SCE transmission lines originate at the SCE switchyard at Hoover Dam. They terminate in Chino, California. Because of the association of the transmission lines to Hoover Dam and their significance in the World War II effort, the SCE 220-Kilovolt North and South Lines were evaluated as eligible for the NRHP under Criterion A and the CRHR under Criterion 1. And, because the Pisgah Substation is a component of the SCE 220-kV North and South Transmission Lines, is also deemed eligible for the NRHP under Criterion A and for the CRHR under Criterion 1.

Archaeological site CA-SBR-12992H near the SCE North and South Transmission Lines, and may be the remains of a work camp related to the construction of the transmission lines and the Pisgah Substation. More particularly, the site is a small, low density scatter of historic trash with four concentrations of historic refuse. The record shows that the site was evaluated as not eligible for the NRHP and CRHR because of the low quantity of artifacts, lack of integrity, low probability of subsurface artifacts and features, and little potential for the site to yield important information or be a contributor to the potential historic district.

Both the National Park Service and State of California definitions indicate that historic districts must have definable and precise boundaries and that these boundaries rarely are defined by planning or management boundaries, or by ownership parcels, but rather must be based upon the spatial locations of the district's contributing properties (Title 14, California Code of Regulations, Chapter 11.5, Section 4852(a)(5); U.S. Department of the Interior, National Park Service 2002). Only about 4.7 miles of the transmission lines were recorded as part of the Calico Solar project within the historic built environment one-half mile buffer.

Because the entire route of the transmission line was not studied as part of the project, the evidence does not allow for the delineation of a boundary that is not arbitrarily defined. Therefore, based on the evidence, it appears inappropriate to define a district based on these resources. (Ex. 309, pp. C.2-117 to C.2-118.)

Atlantic & Pacific (Atchison Topeka & Santa Fe) Railroad Historic District

Resources that could be included in a potential A&P Railroad historic district are the railroad (CA-SBR-6693H) and seven nearby refuse deposits. The Atlantic & Pacific Railroad was originally recorded as a historic resource in California in 1990. The railroad currently is used and maintained as the BNSF. In the project area of analysis, the railroad has a double trackway on a raised, ballasted bed. The railroad has been previously evaluated as eligible for the NRHP and CRHR under Criterion A/1 for its association with the history of transportation in California. Although much of the railroad has been upgraded for continued use and few historical materials remain in place, the segment in the Project vicinity retains integrity of location. Thirteen previously unrecorded bridges were identified during the Class III intensive field survey along the railroad within the Project area of analysis and the one-half mile built environment buffer. Five of these retain sufficient integrity to be considered contributing elements to the railroad.

As discussed above, both the National Park Service and State of California definitions indicate that historic districts must have definable and precise boundaries and that these boundaries rarely are defined by planning or management boundaries. The railroad is a long, linear resource that extends across seven states, and only about 10.5 miles of the railroad were recorded as part of this Project within the historic built environment one-half mile buffer. Because the entire route of the railroad was not studied as part of this Project, we cannot delineate a boundary for a segment of the railroad in the Project vicinity that would not be arbitrarily defined by the Project and buffer areas. Therefore, it seems inappropriate to define a district.

With respect to the seven historic refuse sites located in the vicinity of the railroad, including CA-SBR-13002/H, -13012H, -13014H, -13017H, -13023/H, -13101, and -13108H, the evidence shows they have few temporally diagnostic artifacts. It is therefore unclear whether these sites are contemporaneous. In addition, the types of artifacts associated with these sites do not indicate clear associations with the railroad. Three of these sites were evaluated as not eligible for the NRHP and CRHR because of the low quantity of artifacts, lack of integrity, low probability of subsurface artifacts and features, and little potential to yield

important information. Four of these sites (CA-SBR-13002/H, -13012H, -13014H, and -13017H) were recommended as eligible for the NRHP and CRHR for their potential to yield important information although further testing is required to determine if additional information can be obtained to support the hypothesis that these sites are related to railroad activities or some other activity. Inclusion of those properties in a historic district would not upgrade their status for preservation purposes. (Ex. 309, pp.C-2-118 –C-119.)

National Old Trails Road/U.S. Route 66 Historic District

Resources that could be included in the potential National Old Trails Road /U.S. Route 66 Historic District are extant segments of National Old Trails Road, U.S. Route 66, and two rock concentrations. The CEC and BLM identified a third rock concentration, P36-014578, that appears unrelated to the highways.

National Old Trails Road and U.S. Route 66 are more fully discussed above. In summary, the evidence shows National Old Trails Road in the project area of analysis is represented by eight remnant segments of a batched mix oil road. The condition of the road segments is poor—most of the road surface is crumbled and cracked, and in places has eroded. Some segments buried by sand may be partially intact.

In 1926, the National Old Trails Road was designated as U.S. Route 66, but in the 1930s the segment in the project area of analysis was abandoned in favor of a route to the south, which is the current alignment of historical U.S. Route 66. Both the National Old Trails Road and 1930s alignment of U.S. Route 66 have been recorded under site number CA-SBR-2910H, and previously evaluated as eligible for the NRHP under Criterion A as one of the first all-weather highways in the United States. The segment of U.S. Route 66 in the project area of analysis retains historical integrity and is considered eligible. The National Old Trails Road in the project area of analysis is isolated, segmented, in generally poor condition, and is recommended as a non-contributing element of the highway.

Two rock clusters also were recorded (P36-014519 and P36-014520) along the abandoned segment of the National Old Trails Road. However, no historical as-built drawings of the highway have been located, and thus, a direct association between the rock clusters and the highway remains ambiguous. The rock clusters are recommended ineligible for the NRHP and not significant historical resources eligible for listing in the CRHR.

Segments of U.S. Route 66 and the National Old Trails Road have been listed in the NRHP in several states. U.S. Route 66 related districts have been listed but they include properties such as roadside businesses related to the development of the highway within the boundaries of a specific town or locality. There are no such properties in the project vicinity.

A statewide inventory of U.S. Route 66 has not been conducted for California. If a historic district or multiple property listing of the highway was defined in California, the segment of the 1930s U.S. Route 66 in the Project vicinity probably would be considered a contributing element. However, defining a U.S. Route 66 district at the project limits would be arbitrary for a highway that ran through Illinois, Missouri, Kansas, Oklahoma, Texas, New Mexico, Arizona, and California. Further, because the other associated properties have little historic value, there is no established justification for defining a National Old Trails Road/U.S. Route 66 Historic District. (Ex. 309, pp. C-2-119 to C-2-120.)

Potential Early Twentieth Century Gravel Mining Landscape

Staff recommended the consideration of a historical archaeological landscape that represents an early twentieth century gravel mining operation in the south-central portion of the project area of analysis. Gravel was applied to sections of the road during improvement activities in the mid 1920s, and some of this gravel may have been obtained from the well- developed desert pavements adjacent to the road alignment.

Research and site revisits have revealed no conclusive data to determine the age of the surface disturbance (cleared area) along the National Old Trails Road that occurs within the Project area of analysis. There have been several other past Projects (historic and modern) that may be attributed to the surface disturbance found within the Project area of analysis other than the National Old Trails Road, such as the BNSF railroad and three pipelines within the same area as the disturbances. Modern surface prospects also occur in the Project area of analysis. These modern prospects are found on modern maps (1982 U.S.G.S. 7.5-minute topographic quadrangles), and are absent from historic maps (1955 U.S.G.S. 15-minute quadrangles). In addition, the majority of surface deposits lack diagnostic material (documentation and/or datable cans/refuse). San Bernardino County was responsible for route planning at the time the National Old Trails Road was designated, and the route may or may not have been professionally engineered. No historical as-built drawings of the highway have been located, and thus, a direct association between surface disturbances remains ambiguous.

The National Park Service states that the boundaries of a district or landscape "must be a definable geographic area that can be distinguished from surrounding properties by changes such as density, scale, type, age, style of sites, buildings, structures and objects, or by documented differences in patterns of historic development or associations" (U.S. Department of the Interior, National Park Service 2002:6). In this regard, the evidence indicates that while the spatial relationship between historic road and surface gravel mining disturbance is distinctive, the utilization of the surface for stone resources within the project area of analysis cannot be well bounded. As a result, defining an early twentieth century gravel mining landscape seems inappropriate because the activity lacks sufficient data to be directly attributed to gravel mining for the construction and maintenance of the National Old Trails Road. Additionally, the surface mining activity cannot be clearly linked with the early twentieth century period because a number of historic and modern ground disturbing related Projects have taken place in this area over time, the lack of directly associated temporally diagnostic artifacts, and the absence of historical documentation providing location and time period for this specific activity. The lack of datable material also severely limits the utility of cleared areas to address important research issues. Thus, there is no basis for defining a landscape. (Ex. 309, pp. C-2-120 to C-2-122.)

10. Construction and Operation Impacts

We have evaluated the potential project impacts to the identified CRHR-eligible cultural resources to determine if these impacts are substantial and adverse. We have also assessed whether the proposed project has the potential to impact as-yet-unknown buried archaeological resources. Our findings are summarized below.

a. Construction Activities

Site preparation would be based on avoiding major washes and minimizing surface-disturbing activities. Areas of sensitive habitat and cultural resources would also be avoided wherever possible. Brush trimming, which consists of cutting the top of the existing brush while leaving the existing native plant root system in place to minimize soil erosion, would be conducted between alternating rows of SunCatchers™.

After brush trimming, blading for roadways and foundations will be conducted between alternating rows of SunCatchers™ to provide access to individual SunCatchers™. Blading would consist of removing terrain undulations and would

be limited to 3 feet in cut and 3 feet in fill. The blading operations would keep native soils within 100 feet of the pre-development location, with no hauling of soils across the site.

Paved roadways would be constructed as close to the existing topography as possible, with limited cut-and-fill operations to maintain roadway design slope to within a maximum of 10 percent. Minor grading would also be required for building foundations and pads and parking areas in the Main Services Complex and substation areas. The clearing, blading, and grading operations would be undertaken using standard contractor heavy equipment.

From the preliminary geotechnical investigations, it is expected that lightly loaded equipment and structures, would be supported on shallow footings. Shallow footings would be continuous strip and isolated spread footings.

The majority of each SunCatcher™ would be supported by a single metal pipe foundation that is hydraulically driven into the ground. These foundations are expected to be approximately 20 feet long and 24 inches in diameter. Shallow drilled pier concrete foundations of approximately 36 inches in diameter and an embedment depth with a minimum socketed depth into rock of 6 feet would be used for hard and rock-like ground conditions. The buildings and major structures such as yard tanks would be supported on shallow spread and continuous footings or mat-type foundations. Deep foundations would be required for heavy items, such as the power transformers at the electrical substation.

With respect to materials and equipment staging**,** 100-acre lay down yard will be cleared on the southeast corner of the project site where SunCatchers will be assembled. Assembly buildings will be constructed adjacent to the Main Services Complex for the onsite assembly of the SunCatchers. The assembly buildings will be decommissioned and salvaged for re-use once all Calico Solar SunCatchers have been installed. SunCatchers will be installed in the area vacated by the removal of the construction laydown areas and assembly buildings when construction is completed.

Regarding trenching for buried linear facilities (i.e., pipelines, transmission) SunCatcher systems will be tied together by an underground cable system. And, Final design and construction of transmission facilities and reliability upgrades at the SCE Pisgah Substation and the Pisgah-Lugo 230 kV Transmission Line (should they be required) will be completed by SCE as more fully discussed in the Project –Related Future Actions section below.

b. Construction Impacts

As discussed above, the 6,215 acre footprint will avoid three sites identified by BLM as eligible for inclusion in the NRHP. As a result, BLM issued a finding of no adverse effect to historic properties and sought concurrence from the State Historic Preservation Officer (SHPO). (Ex. 309, p. C.2-26.) The SHPO concurred with BLM's determination that the sites deemed eligible are eligible for NRHP. that BLM the SHPO neither concurred with nor objected to the BLM's determination that the remaining sites within the area of potential effects were not eligible. (8/25/10 RT .21.)

But, as also discussed above, Staff has produced evidence establishing that construction of the project may wholly or partially destroy the majority of surface archaeological resources in the project area, which were identified by the Applicant. More particularly, it appears that 100 surface prehistoric archaeological sites in the current project footprint have not yet been adequately investigated or evaluated in terms of potential to yield data important to the study of prehistory. It also appears that project construction has potential to destroy a large portion of a potential prehistoric archaeological landscape that may exist in the project area.

The evidence also establishes the potential for indirect effects to archeological sites in the exclusion areas as a result of activities such as increased traffic during project construction. Project area may also increase the amount of sheet washing and water runoff during heavy rainfall and indirectly cause damage to sites outside the project area.

The evidence presented does not identify precisely which of the different archaeological resources are historically significant, leaving us unable to identify with particularity the exact character of the effects that the construction of the proposed facility would have on such resources. We can nonetheless draw a reasonable inference from the evidence that the construction of the proposed facility could have a significant effect on the environment that requires mitigation under CEQA and that feasible mitigation measures can be implemented building upon the analytical process that has already been initiated, documented, and explained in the record.

More specifically, the Applicant, Staff, and BLM have defined an appropriate geographic extent of the project area of analysis and they have collectively contributed to the creation of an inventory of the known cultural resources within

that area. With implementation of Conditions of Certification **CUL-1** through **CUL-5** and **CUL-7** through **CUL-11,** potential impacts to both known and unknown resources will be avoided or mitigated to less than significant levels**.**
The Conditions of Certification require the project owner to collect the necessary surface and subsurface data on the resources sufficient to develop formal recommendations of historical significance, assess effects to significant resources, and implement mitigation measures that meet the standards for the resolution of significant effects to significant cultural resources. In addition, Energy Commission licensing decisions and BLM right-of-way grant decisions also typically identify the likelihood of encountering previously unknown resources and contain provisions that require specific procedures to ensure that any effects to these resources can be resolved.

Cultural resources that are found to be significant on the basis of their information value (principally archaeological deposits) would be subject to treatments which would variably be to actively avoid all or part of subject deposits, to record and preserve representative samples of the unique spatial or associative information that is intrinsic to the depositional history of each deposit, to collect and curate representative samples of material culture assemblages, to provide for the preparation and dissemination of professional technical publications and public interpretative materials, and to develop and implement plans to foster the long-term historic preservation of subject deposits. Archaeological resources in the project area of analysis that may be subject to unique treatment plans may include archaeological landscapes and/or districts, in addition to individual archaeological sites.

c. Operation Activities and Impacts

SunCatcher mirror washing, operations dust control, potable water use, and water treatment under regular maintenance routines will require an average of 33.4 gallons of raw water per minute, with a daily maximum requirement of 56.6 gallons of raw water per minute during the summer peak months each year, when each SunCatcher receives a single mechanical wash. Road and SunCatcher area long-term maintenance would include:

- Temporary soil stabilization (SS) techniques, such as scheduling construction sequences to minimize land disturbance during the rainy and non-rainy seasons and employing BMPs appropriate for the season; preserving existing vegetation by marking areas of preservation with temporary orange propylene fencing; using geotextiles, mats, plastic covers, or erosion control blankets to stabilize disturbed areas and protect soils from erosion by wind or water;

using earth dikes, drainage swales, or lined ditches to intercept, divert, and convey surface runoff to prevent erosion; using outlet protection devices and velocity dissipation devices at pipe outlets to prevent scour and erosion from storm water flows; and/or using slope drains to intercept and direct surface runoff or groundwater to a stabilized water course or retention area.

- Sediment Control (SC) techniques, such as using silt fences, straw bales, and/or fiber rolls to intercept and slow the flow of sediment-laden runoff such that sediment settles before runoff leaves the site.
- Wind Erosion (WE) control by applying water or dust palliatives, as required, to prevent or alleviate windblown dust.
- Tracking Control (TC) techniques to limit track-out, such as using stabilized points of entering and exiting the project site and stabilized construction roadways on the site.
- Other measures, as appropriate, to comply with the regulations.

Many direct and indirect impacts described above as part of construction also apply to the operation phase. During operation of the proposed power plant, repair of a buried utility or other buried infrastructure could require the excavation of a large hole. Such repairs have the potential to impact previously unknown subsurface archaeological resources in areas unaffected by any original trench excavation. Thus, Conditions of Certification **CUL-1**, **CUL-2**, and **CUL-8** through **CUL-10** are equally applicable to project operations to mitigate impacts to known and unknown archaeological resources. (Ex. 309, pp.C.2-129 to C-2-130.)

11. Impacts to Built-Environment Resources

As discussed above, four built-environment resources are eligible for NRHP or CRHR (U.S. Route 66 (CA-SBR-2910H), the SCE 220-kilovolt (kV) North and South Transmission Lines (CA-SBR-13115H and 13116H, respectively), and the Pisgah Substation (CA-SBR-13117H)).

The evidence shows that there will be a direct visual effect to U.S. Route 66 from the installation of the proposed 26,450 solar dishes. The installation of this large number of SunCatchers, consisting of an approximate 40-foot diameter solar concentrator dish that supports an array of curved glass mirror facets, will alter the vast, open landscape that is a character-defining feature of this section of Route 66, as well as of the rest of Route 66 in the Mojave Desert. The travel experience of this section of Route 66—which has been substantially unchanged since its construction—will be permanently impaired.

Potential mitigation measures were proposed such a providing on-site and/or off-site screening or eliminating the first few rows of solar dishes. Screening measures are infeasible given that the area is relatively flat and consists only of scrub vegetation. The significance of Route 66 in the Mojave is the view of the vast, unobstructed, flat expanse of desert landscape which would be impeded by any type of screening, either on the roadway itself or on the edge of the project site. Furthermore, eliminating the first few rows of solar dishes would not lessen the visual impact of the proposed project, as the views are unobstructed for approximately 20 miles.

Although we therefore find that this impact is significant and unavoidable, we have also determined that overriding considerations justify this impact and make factual findings in support thereof in the **Override Findings** section of this Decision.

Notwithstanding the unmitigable nature of the impact, we also adopt Condition of Certification **CUL-6** requiring photodocumentation of the roadway view of the 9-mile segment of roadway and associated landscapes and viewsheds within the project area. The photodocumentation would include large-format negatives that clearly depict the appearance of the property and areas of significance or the site, perspective-corrected and fully captioned. Undertaking the HABS recordation activities prior to certification would not affect the project's certification prospects. (Ex. 309, pp. C-2-128 to C-2-129.)

12. Project Closure and Decommissioning

Decommissioning of the proposed project may wholly or partially destroy all archeological sites on the surface of the project area. (Ex. 309, p. C.2-90.) Re-excavation and removal of SunCatchers™ and ancillary facilities could impact cultural resources. Conditions of Certification **CUL-1**, **CUL-2**, and **CUL-8** through **CUL-10** would provide for mitigating impacts to cultural resources encountered during project decommissioning activities.

13. Project –Related Future Actions

We also consider the potential impacts of future transmission line construction, line removal, substation expansion, and other upgrades that might be required by SCE as a reasonably foreseeable result of the Calico Solar project if approved and constructed as proposed. (Ex. 309, pp. C-2-136 to C-2-141.)

Our focus here is on two possible upgrade scenarios:

(1) The 275 MW Early Interconnection Option – This includes upgrades to the existing SCE system to result in 275 MW of additional latent system capacity. The Pisgah Substation would be expanded adjacent to the existing substation, one or two new 220kV structures would be constructed to support the gen-tie line from the project into the Pisgah Substation, and new telecommunications facilities would be installed within existing rights of way.

(2) The 850 MW Full Build-Out Option – This include replacing a 67-mile 220 kV SCE transmission line with a new 500kV line, expanding the Pisgah Substation at a new location and making other telecommunication upgrades to allow for additional transmission system capacity to support operation of the Calico Solar project. (Ex. 309, p. C.2-137.)

Staff produced evidence generally describing the potential environmental and health effects that may result from these upgrades. BLM and the California Public Utilities Commission will fully evaluate the SCE upgrades and related projects in an Environmental Impact Report/Environmental Impact Statement (EIR/EIS).

Environmental Setting

The upgrades would be within the Lugo-Pisgah project area located in the western Mojave Desert where numerous large-scale inventory projects have been conducted. In part, these projects have defined a cultural chronology for the area that spans the last 12,000 years. Ethnographically, the project area is centered on the traditional lands of the Serrano, a Numic speaking group related to the Shoshone. Between these earliest and latest Native American periods is a rich cultural history.

The Mojave Desert is suggested to have been the area of principal point of origin for the migration of the Numic language group, which spread northeastward into the Great Basin and eventually the northern Colorado Plateau. Many of the distinctive projectile point types described for the Great Basin and Southwest culture areas may have originated in the broad geographic area of the Mojave Desert.

Native American history begins with the Clovis culture, the earliest substantively established cultural period in the Western Hemisphere and the only “classic” Paleo-Indian period represented in the project area. Dated from 10,000 to 8,000

B.C., the Clovis period is represented by distinctive spear points with a central flute or groove on either side of the point. These points are extremely well made and have been found in association with extinct Pleistocene megafauna.

The evidence shows that the transition from the Pleistocene to the Holocene is marked by significant environmental changes that resulted in equally significant changes in human settlement and subsistence strategies. The Lake Mojave Complex follows Clovis and subsumes several other named complexes, including the Western Pluvial Lakes Tradition and the San Dieguito Complex, among others. Again, the Mojave Complex is represented by a distinct projectile point that tapers to a rounded base. Dates of the complex are ca. 8000 to 6000 B.C. The period is associated with relatively wet conditions and periodic lake recharge in the region. Material culture for the period is dominated by a stone tool technology geared towards a forager-like subsistence strategy. Such a strategy reflects the frequently changing environmental conditions and patchy resources that would be available necessitating frequent settlement shifts.

Changing environmental conditions to more arid, present-day conditions, marks the transition to the Middle Holocene and the Pinto Complex, which overlaps slightly with the preceding Lake Mojave Complex, and persists to about 3000 B.C. There is broad similarity with the Lake Mojave Complex, especially in toolstone selection and overall technology; however, the Pinto Complex begins the first extensive use of milling tools presumed to reflect the intensification of vegetal processing. An emphasis towards plant resources probably reflects a more predictable biotic environment. The range of settlements across the landscape also suggests more predictable subsistence resources and characterizes the complex overall as spatially extensive.

The evidence details the characteristics of complexes, including the Deadman Lake Complex (7500 – 5200 B.C.) and the post 2000 B.C. Gypsum Complex, represented by well-known projectile point styles, including the contracting stemmed Gypsum, Elko series, and Humboldt series projectile point types. By A.D. 200 the Rose Springs Complex marks the introduction of the bow and arrow technology and significant population increase.

The Late Prehistoric period extends from the close of the Rose Springs Complex ca. A.D. 1100 and ends with the ethnographically described groups occupying the area at contact in the 16th century. It is during this period that Ancestral Puebloan groups are known to have exploited turquoise mines and probably interacted with resident Numic speaking Paiute and Shoshone groups. It is

during this period that the postulated Numic expansion took place out of the Mojave Desert northeastward into the Great Basin. A return of warm and dry conditions, coupled with linguistic evidence, suggest this expansion began sometime before A.D. 1000 (SES 2008a).

Spanish settlement of southern California took place after the first mission was established in 1769. The Serrano, a Shoshonean group, were the primary inhabitants of the project area. Serrano lived in large square communal houses and practiced an extensive trade network with the coast. Secularization of the Spanish missions in 1834 led to the development of large ranchos that extended into the interior from the coast. Ranchos often forced Native American groups into a form of indentured servitude. These closed, fortified communal settlements continued after non-Mexican immigrants entered the region. Upon statehood in 1850, industrialization began with the building of railroads, including the Atchison, Topeka & Santa Fe (AT&SF), mining, and the development of military installations ((Ex. 309, pp C.2-137-C.2-139.)

Potential Cultural Resources.

To date, no formal file and literature review and no intensive cultural resources inventory has taken place in the area of potential effect along the Lugo-Pisgah right of way (ROW).

Based on the cultural resources overview presented above, it is likely that a number of prehistoric cultural resources would be identified during inventory for the proposed area of the 850 MW Full Build-Out upgrades. The 275 MW Early Interconnection upgrades would require substantially less ground disturbance and the chance of encountering cultural resources would be reduced. Likely locations for prehistoric archaeological sites include the edges of intermittent drainages, such as those that drain into Antelope Valley near the western end of the project area and ultimately the terraces above the Mojave River. East of the Mojave River it is expected that the number of prehistoric resources will decrease as the corridor extends across Apple and Fifteen-Mile Valleys. However, the many ephemeral drainages that bisect these areas are relict stream channels that could have archaeological sites in association. The margins of both Rabbit Lake and Lucerne Lake also have the potential to contain prehistoric resources. Sites along relict stream channels and desiccated lake margins could include prehistoric campsites and resource processing localities.

Potential historic resources include both the Pisgah and Panoche/Lugo substations, if more than 45-years old, and the 220 kV transmission line that is to

be replaced by the new 500-kV line. If these resources meet the age criteria for consideration then a qualified architectural historian must document the resources on appropriate Department of Parks and Recreation (DPR) forms and assess the significance and potential impact to these resources. Other potential historic resources include the crossing of the AT&SF Railroad (two locations) and the California Aqueduct. Numerous other transmission lines would also be crossed. (Ex. 309, p. C.2-139.)

Environmental Impacts

Impacts to cultural resources are unknown pending a formal file and literature review and intensive inventory. Since the proposed **500 kV** transmission line corridor would follow an existing ROW for much of its proposed length, it is possible that impacts to cultural resources would be lower due to prior impacts. New construction would have the potential to adversely affect cultural resources from ROW/access road construction, blading, equipment storage, pole placement, substation expansion and line installation.

Ground disturbance, the presence of vehicles driving over the top of sites and the installation of new towers could damage archaeological resources. After the work area is defined and after archaeological and historic surveys are complete in any areas that have not been protocol-level surveyed previously by SCE, archaeological sites or historic resources within the built environment may be identified. Depending on when they were built, if the existing SCE 220 kV line or the Pisgah and Panoche/Lugo Substations are determined eligible for the National Register of Historic Places (NRHP), the upgrades and removal effort would result in an impact to historical resources. Other potential historic resources include the crossing of the AT&SF Railroad (two locations) and the California Aqueduct. Whether the impact is significant would need to be determined after the line, substations and/or other infrastructure are evaluated.

Some new lines would be installed in places where there were none previously, and some existing overhead lines would have structures retrofitted and replaced along existing lines. The trench for undergrounding for the Pisgah-Gale fiber optic cable (under the 275 MW Early Interconnection) would normally be excavated in an existing underground cable trench or in a new 600-foot-long trench near the SCE Pisgah Substation, and trenching would not come within 12 inches from any existing fence, wall, or outbuilding associated with an adjacent property. Therefore, there would be no potential to adversely impact the physical condition of existing above-ground cultural resources. The only potential to adversely impact existing above-ground cultural resources would arise from a

change in the visual setting of the property due to the addition of taller poles or new poles, new overhead lines, and new substation equipment depending on the location in the project area.

Any potential for the project to impact cultural resources would be limited to undiscovered below-ground cultural deposits. It is possible that buried cultural deposits could be encountered during ground disturbing project activities including trenching for the installation of underground fiber optic cables, during ground disturbance associated with the removal or installation of transmission structures, or ground disturbance associated with the expansion at the Pisgah Substation. The 275 MW Early Interconnection upgrades would require substantially less ground disturbance than the 850 MW Full Build-Out, and the chance of impacting cultural resources would be reduced. (Ex. 309, p. C-2-140.)

Mitigation

Prior to the start of construction, cultural resources sites would be identified and avoided by vehicles and construction activities. After the construction area has been identified and after work for Section 106 has been completed, Staff recommends that the archeological sites be evaluated for eligibility for listing in the NRHP or CRHR if it appears that any would be affected by the project. Sites that have been evaluated as “not eligible” would warrant no further consideration and avoidance will be required.

Sites that have not been evaluated and sites that are considered “potentially eligible” should be treated as eligible resources pending formal evaluation. If found to meet age and significance criteria, the historic resources identified above, including the substations and the existing 220 kV transmission line, would require Level 1 Historic American Engineering Records (HAER) be completed in order to mitigate adverse effects. The crossing of the AT&SF railroad, other historic transmission lines, and the California Aqueduct would likely result in the determination of no adverse effect.

Staff recommends conducting data recovery as a mitigation measure for archaeological sites that are recommended as eligible to the CRHR or NRHP and would be impacted by the project. Monitoring of project-related excavation within an archaeological site is not appropriate mitigation and may destroy the site. SCE should comply with provisions of the National Historic Preservation Act and should consult with a California State Historic Preservation Officer regarding appropriate mitigation should any cultural materials be encountered during construction or other ground-disturbing activities.

In the event of a site discovery during project implementation, all work shall stop in the immediate area in order to afford time for documentation, evaluation, and consultation between the lead federal agency, the California State Historic Preservation Officer (SHPO), and all consulting tribes if a discovery is aboriginal in origin. Consultation with the above entities would ensue regardless of whether the discovery is located on private or federal lands. If consultation determines that the discovery is eligible for the NRHP, a consideration of effects should be undertaken pursuant to 36 CFR 800.5 of the National Historic Preservation Act (NHPA, 1966, as amended). If consultation results in a determination of adverse effects to a historic property, mitigation measures would be proposed and implemented following consultation with the California SHPO, the lead federal agency, the Advisory Council on Historic Preservation (ACHP), and all consulting Tribes, if necessary. Avoidance would be the preferable mitigation measure in all instances. (Ex. 309, pp. C-2-140 to C-2-141.)

Staff's analysis further indicates that while SCE would attempt to avoid effects to known cultural sites, it is possible that the corridors have sensitive cultural resources that may not be avoidable and could be affected. Thus, with implementation of Conditions of Certification adopted herein, it would be possible to mitigate all impacts to cultural resources to less than a significant level and to implement recommended measures that apply to cultural resources. Known sensitive areas would be avoided and construction activities would be monitored. (Ex. 309, p.C.2-141.)

14. Cumulative Impacts

The geographic area considered for cumulative impacts on cultural resources is the Calico Solar Project area (Newberry Springs/Ludlow area). Future development projects in the immediate Newberry Springs/Ludlow area have also been identified. The following projects or developments are considered most relevant to effects on cultural resources. (Ex 309, p. 309, p C-2-142, See also Ex. 300, §B.3, Tables 1A, 1B, 2, 3, Figures 1 - 3):

Project	Location
Twentynine Palms Marine Corps Air Ground Combat Center (MCAGCC)	Morongo Basin (to the south of project site)
SEGS I and II	Near Daggett (17 miles west of project site)
CACTUS (formerly Solar One and Solar Two)	Near Daggett (to the west of project site)
Mine	2 miles west of project site along I-40
Mine	14 miles west of project site along I-40

According to the evidence, cultural resources in the geographic area have been impacted by past and currently approved projects in the following ways:

1. Because cultural resources are non-renewable, the removal or destruction of any resource results in a net loss of resources

2. Existing development in the Newbury Springs/Ludlow area and the surrounding areas has resulted in the removal or destruction of cultural resources, which has resulted in a net loss of resources in these areas

Cultural resources are also expected to be further affected by the following reasonably foreseeable future projects:

SES Solar Three (CACA 47702)
SES Solar Six (CACA 49540)
SCE Pisgah Substation Expansion
Pisgah-Lugo transmission upgrade
Twentynine Palms Expansion
Broadwell BrightSource (CACA 48875)
Wind project (CACA 48629)
Wind Project (CACA 48667)
Wind project (CACA 48472)
Twin Mountain Rock Venture
Solar thermal (CACA 49429)
Proposed National Monument (former Catellus Lands)
BLM Renewable Energy Study Areas
SES Solar Three (CACA 47702)
SES Solar Six (CACA 49540)
SCE Pisgah Substation Expansion
Pisgah-Lugo transmission upgrade
Twentynine Palms Expansion
Broadwell BrightSource (CACA 48875)

Wind project (CACA 48629)
Wind Project (CACA 48667)
Wind project (CACA 48472)
Twin Mountain Rock Venture
Solar thermal (CACA 49429)
Proposed National Monument (former Catellus Lands)
BLM Renewable Energy Study Areas

In combination with the above-identified projects, the construction of the Calico Solar project would likely result in permanent adverse impacts related to the removal or partial destruction of archaeological resources on the project site during construction-related ground disturbance. As discussed above, the construction of the proposed project would also result in unmitigable adverse impacts to several built-environment resources, particularly a contributing segment of U.S. Route 66, due to the profound visual intrusion of the project on the landscape.

It is further expected that the construction of some or all of the foreseeable cumulative projects which are not yet built may also result in the permanent, potentially unmitigable, adverse impacts as a result of the removal or partial destruction of the archaeological resources on the sites for those projects and as a result of the visual intrusion of some of these projects on Mojave Desert vistas.

The construction of the Calico Solar Project and other foreseeable cumulative projects will contribute to permanent long term, potentially unmitigable, adverse impacts as a result of the physical degradation of and visual intrusion on significant cultural resources on those sites and an overall net reduction in cultural resources in the area.

Project operation may also result in similar impacts as a result of some or all of the cumulative projects, as more people come into this area associated with those new land uses. As a result, operation the Calico Solar Project and the other cumulative projects may contribute to a cumulative adverse impact on cultural resources as a result in increased access to the area and the potential for increased vandalism, illegal collection of artifacts, and/or destruction of resources during operation related activities. (Ex. 309, pp. C-2-141 to C-2-144.)
To minimize the region-wide, significant cumulative impacts to less than significant levels, we adopt Conditions of Certification **CUL-1** through **CUL-10.**

15. Compliance with LORS

Projects licensed by the Energy Commission are reviewed to ensure compliance with all applicable laws. Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies. The BLM is responsible for compliance with NEPA and Section 106 of the NHPA.

The evidence discussed above establishes that, if Conditions of Certification **CUL-1** through **CUL-11** are properly implemented, the proposed project would be in compliance with CEQA and all applicable state laws, ordinances, regulations, and standards (LORS). The applicable LORS are identified in **Appendix A** to this Decision, and resolve effects under Section 106 of the NHPA on known and newly found cultural resources. The Applicant proposed **CUL-11** to ensure compliance with the requirement of California Health and Safety Code section 7050.5 if human remains are encountered.

Specifically with respect to local LORS, the County of San Bernardino's General Plan has general language promoting the county-wide preservation of cultural resources. The Conditions of Certification require specific actions to promote and effect historic preservation and mitigate impacts to all cultural resources. Thus, if the project owner implements the Conditions, its actions would be consistent with the County's historic preservation goals.

16. Response to Comments

Intervenor California Unions for Reliable Energy (CURE) commented on the cultural resources section of the SA/DEIS relating to opportunities for meaningful public participation in the proceedings, the sufficiency of environmental setting description and data relating to potentially significant impacts to cultural resources. Those comments, and Staff's responses, are more fully set forth in the SSA, Ex. 309, pages C.2-145 through C.2-147. We have carefully considered the comments and responses, and that consideration is reflected in our discussion of this topic and our findings. No public comments were received.

FINDINGS OF FACT

Based on the evidence, the Commission makes the following findings and reaches the following conclusions:

1. Without mitigation, the Calico Solar project would have a significant direct impact on historically significant archaeological resources.

2. Without mitigation, the Calico Solar project has the potential to have a significant indirect impact on contributors to a historically significant cultural landscape, including ethnographic resources.

3. There are resources within the proposed Calico Solar site footprint and linear facilities corridor that are eligible or assumed eligible for listing in the NRHP and the CRHR.
4. Tribal governments have been contacted for a Section 106 consultation.

5. The project will result in a significant and unavoidable visual impairment impact to a segment of historic U.S. Route 66 by altering the vast, open landscape that is a character-defining feature of that section of Route 66; overriding considerations justify approving this project despite this and other significant unmitigated impacts as is more fully explained in the **Override Findings** section of this Decision.
6. Conditions of Certification **CUL-1** through **CUL-11** ensure that all direct, indirect, and cumulative impacts to cultural resources will be mitigated to insignificant levels.

CONCLUSIONS OF LAW

1. With implementation of the Conditions of Certification below, the Calico Solar Project will conform to all applicable laws, ordinances, regulations, and standards relating to cultural resources as set forth in the pertinent portion of **Appendix A** of this Decision.

2. Even with implementation of the Conditions of Certification the project will have a significant and unavoidable impact to a segment of U.S. Route 66 by altering the Route's viewscape in the project vicinity. All other potential direct, indirect, and cumulative cultural resources impacts are mitigated to insignificant levels.

CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance (includes "preconstruction site mobilization," "ground disturbance," and "construction grading, boring, and trenching," as defined in the General Conditions for this project), the project owner shall obtain the services of a Cultural Resources

Specialist (CRS) and one or more alternate CRSs (at the project owner's option).

The CRS shall manage all cultural resources monitoring, mitigation, curation, and reporting activities in accordance with the Conditions of Certification (Conditions). The CRS may elect to obtain the services of Cultural Resources Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No ground disturbance shall occur prior to Compliance Project Manager (CPM) approval of the CRS and alternates, unless such activities are specifically approved by the CPM.

Approval of a CRS may be denied or revoked for reasons including but not limited to non-compliance on this or other Energy Commission projects. After all ground disturbance is completed and the CRS has fulfilled all responsibilities specified in these cultural resources conditions, the project owner may discharge the CRS, if the CPM approves. With the discharge of the CRS, these cultural resources conditions no longer apply to the activities of this power plant.

Cultural Resources Specialist

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61 (36 C.F.R., part 61). In addition, the CRS shall have the following qualifications:

1. The CRS's qualifications shall be appropriate to the needs of the project and shall include a background in anthropology, archaeology, history, architectural history, or a related field;
2. At least three years of archaeological or historical, as appropriate (per nature of predominant cultural resources on the project site), resource mitigation and field experience in California; and
3. At least one year of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

The resumes of the CRS and alternate CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS/alternate CRS on referenced projects and demonstrate to the

satisfaction of the CPM that the CRS/alternate CRS has the appropriate training and experience to implement effectively the Conditions.

Cultural Resources Monitors

CRMs shall have the following qualifications:

1. a B.S. or B.A. degree in anthropology, archaeology, historical archaeology, or a related field, and one year experience monitoring in California; or

2. an A.S. or A.A. degree in anthropology, archaeology, historical archaeology, or a related field, and four years experience monitoring in California; or

3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of monitoring experience in California.

Cultural Resources Technical Specialists

The resume(s) of any additional technical specialist(s), e.g., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval.

Verification: At least 45 days prior to the start of ground disturbance, the project owner shall submit the resume for the CRS, and alternate(s) if desired, to the CPM for review and approval.

At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural resources documents, field notes, photographs, and other cultural resources materials generated by the project. If no alternate CRS is available to assume the duties of the CRS, a monitor may serve in place of a CRS so that ground disturbance may continue up to a maximum of 3 days without a CRS. If cultural resources are discovered then ground disturbance will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this Condition.

At least 5 days prior to additional CRMs beginning on-site duties during the project, the CRS shall provide letters to the CPM identifying the new CRMs and attesting to their qualifications.

At least 10 days prior to any technical specialists, other than CRMS, beginning tasks, the resume(s) of the specialists shall be provided to the CPM for review and approval.

At least 10 days prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions.

CUL-2 Prior to the start of ground disturbance, if the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, confidential cultural resources reports (upon BLM approval), and the Energy Commission's Supplemental Staff Assessment Part II (SSA Part II) and the BLM's Final Environmental Impact Statement (FEIS) for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2400 or 1" = 200') for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification: At least 15 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, confidential cultural resources documents, the SSA Part II, and the FEIS to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

At least 15 days prior to the start of ground disturbance, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.

At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.

Weekly, during ground disturbance, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.

Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

CUL-3 Changes to the proposed project or to the character of its construction, operation, and maintenance that may become necessary subsequent to the approval of the project, were such approval to occur, may in turn require the re-consideration of the extent of the original project area. Where such changes indicate the need to alter the original project area to include additional lands that were not elements of analysis during the certification process, the effects of any proposed changes on historical resources that may be on such lands would need to be taken into account. Changes in the character of the construction, operation, and maintenance of the proposed project may include such actions as decisions to use non-commercial borrow or disposal sites.

Upon the recognition that proposed changes to the project would require the use of lands that were not a part of the original project area of analysis, the project owner shall ensure that the CRS surveys any such lands for cultural resources and record each newly found resource on DPR 523 Series forms. Exceptions would be made to this protocol in cases where cultural resources surveys no greater than five years in age are documented for the entirety of the subject lands and approved by the CPM. Where new cultural resources surveys are warranted, the project owner shall convey the results of such surveys, along with the CRS's recommendations for further action, to the CPM, who will determine whether further action is necessary. If the CPM determines that historical resources may be present and that any such resource may be subject to a substantial adverse change in its significance, the project owner shall ensure that the CRS provides the CPM with substantiated recommendations on whether each such resource is eligible for listing in the CRHR and recommendations for the resolution of any such significant effects. The CRS, the project owner, and the CPM shall then confer on said recommendations, and, upon the concurrence of the CPM with those recommendations, the project owner shall ensure that the CRS proceeds to implement them, and reports on the methods and the results of any such work in the final Cultural Resources Report (CRR) (**CUL-8**).

Verification: Upon the recognition that proposed changes to the project or to the character of the construction, operation, and maintenance of the project would require the use of lands that were not a part of the original project area, the project owner shall notify the CRS and CPM. The project owner shall then provide, for CPM review and approval, documentation of any cultural resources surveys five years or less in age that exist for the additional lands.

At least 105 days prior to the use of the new additional project area lands, in the absence of any such cultural resources surveys or when the extant cultural resources surveys do not cover the entirety of the lands to be added to the project area, the project owner shall ensure that the CRS surveys the additional lands for cultural resources, notifies the project owner and the CPM of the results of the new cultural resources survey, and recommends further action.

No more than 15 days subsequent to the receipt of the information in verification 2, **CUL-3**, above, the CPM shall determine whether historical resources may be present and whether any such resources may be subject to substantial adverse changes in significance.

At least 60 days prior to the use of the new additional project area lands, if the CPM determines that historical resources may be subject to substantial adverse changes in significance, the project owner shall ensure that the CRS provides the CPM with substantiated evaluations, based on archival and field research, on whether each such resource is eligible for listing in the CRHR and recommendations for the resolution of any potential significant effects.

For no longer than 15 days, the project owner, the CRS, and the CPM shall confer about the above evaluations and recommendations, and, upon the concurrence of the CPM with those evaluations and recommendations, the project owner shall ensure that the CRS proceeds to resolve any significant effects pursuant to the above recommendations prior to the use of the new additional project area lands.

The project owner shall ensure that the CRS reports on the methods and the results of all such work in the CRR (**CUL-7**).

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-4 Prior to the start of ground disturbance, the project owner shall develop, prepare, and implement a series of protocols the purposes of which will be to gather and analyze information to refine the assessments of the historical significance of the archaeological resources in the project area of analysis. The project owner shall prepare and submit, for the review and approval of the CPM and consistent with the guidance found in the February 1990 “Archaeological Resource Management Reports (ARMR): Recommended Contents and Format” and the February 1991 “Guidelines for Archaeological Research Designs,” separate protocols for the CRHR evaluation of each archaeological site type or site type group in the CPM-approved, final archaeological resource taxonomy

and for each archaeological district, landscape, or other large-scale archaeological resource in the subject taxonomy. A field methodology will be included in each protocol which outlines a representative sample of 20% of each of the site types which would be selected for further evaluation. Ground disturbance on or in the vicinity of sites selected for evaluation may not commence until the evaluation reports have been completed. Ground disturbance may begin on portions of the project area which do not contain sites selected for further evaluation, subject to the construction monitoring provisions of **CUL-9**. Among the large-scale resources that the project owner shall explicitly are a prehistoric archaeological landscape that encompasses the numerous and diverse individual prehistoric archaeological sites across the desert pavements in the southern portion of the project area, a potential historical archaeological gravel mining district over roughly the western to west-central portion of the project area, and the archaeological remnants of the segment of the National Trails Road in the project area that may be a contributing element to a National Trails Road historic district.

Each CRHR evaluation protocol shall include, at a minimum, the following elements:

1. A background research section which develops interpretive contexts germane to each protocol and which presents information on previous research in the vicinity of the project area, generally, and on previous research on the specific resource types under consideration in the respective protocols.
2. An evaluation phase research design which, in the case of protocols prepared for individual archaeological resource types or type groups, should include a rationalized 20% sample of the resources in a type or type group, rather than a protocol structured to sample 100 percent of the population of a type or type group, and which explicitly takes into account extant information on the subject resources.
3. A detailed and explicit field methodology tailored to acquire the data necessary to address specific research questions.
4. Provisions for specialists to be present on site and specialized laboratory analyses of recovered cultural materials where feasible and if determined necessary to complete CRHR evaluation.
5. Provisions for laboratory analyses of chronometric samples, and organic remains and residues , where feasible and if determined necessary to complete CRHR evaluation .

Where defensible relative to archaeological theory, the project owner may submit documents that, within a single document, tier several separate evaluation protocols from common background research. In such documents, the project owner would develop and present

germane prehistoric or historic contexts and present a general review of previous archaeological research in the project area vicinity before laying out the specific evaluation protocols for particular archaeological resources by reviewing previous archaeological research specific to a resource type, type group, or large-scale resource, and then developing and presenting custom research designs for those particular resources.

Subsequent to the completion of the implementation of each protocol, the project owner shall prepare and submit, for the review and approval of the CPM, separate reports on the results of the implementation of each protocol, on the analysis and interpretation of that data, and on the CRHR evaluation of the resource type, type group, or large-scale resource that a subject protocol addresses.
Each CRHR evaluation report shall include, unless otherwise determined by the CPM , the following elements:

1. Synopses of the background research section, evaluation phase research design, field methodology, and material culture, chronometric, and organic analyses as set out in the relevant original evaluation protocol.

2. A detailed, explicit, illustrated presentation of the results of the field and laboratory work done under the relevant protocol.

3. An analysis and behavioral interpretation of data from previous research and of field and laboratory data acquired as the result of the implementation of the relevant protocol.

4. Formal evaluation of the specific resource types relative to the CRHR program.

The project owner may lump the evaluation reports into report documents that reflect any prior approved protocol documents that contain more than one protocol.

Should an agreement document be executed in consideration of the proposed action pursuant to 36 CFR §§ 800.6 or 800.14(b) among the Bureau of Land Management or other Federal agencies, and the California State Historic Preservation Officer, with or without the participation of the Advisory Council on Historic Preservation, and should that document provide for the collection of factual evidence sufficient to substantiate the evaluation of the California Register of Historical Resources eligibility of those potentially effected archaeological resources, as determined by the CPM, then the applicant shall adhere to the executed agreement document to mitigate any significant effects. The requirements as set out in the executed agreement document shall supersede the requirements set out above

and the requirements set out above would have no further force or effect.

Should the executed agreement document be amended in such a manner that it no longer can be reasonably judged to provide for the collection of factual evidence sufficient to substantiate the evaluation of the California Register of Historical Resources eligibility of those potentially effected archaeological resources, as determined by the CPM, or should the executed agreement document be terminated prior to the complete implementation of the mitigation measures set out in it, then the project owner shall implement the above requirements, in addition to any measures set out under the amended agreement document and in addition to any measures that may have been partially completed prior to the termination of said agreement.

Verification: At least 15 days prior to the start of ground disturbance, the project owner shall have submitted all CRHR evaluation protocols to the CPM for review and approval . CPM review will take no longer than 5 days.

At least 60 days prior to the start of ground disturbance, which would impact sites selected for further evaluation , the project owner shall have submitted all CRHR evaluation reports to the CPM for review and approval.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-5 Prior to the start of ground disturbance, the project owner shall submit the CRMMP, as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall follow the content and organization of the draft model CRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions of Certification in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The Cultural

Resources Conditions of Certification from the Commission Decision are contained in Appendix A."

2. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design will specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. Specific mitigation plans shall be prepared and submitted, for the review and approval of the CPM, for any unavoidable significant effects to archaeological resource types, type groups, or large-scale archaeological resources determined by the process in **CUL-4** to be eligible for listing in the CRHR. Specific mitigation plans shall also be prepared and submitted, pursuant to **CUL-6**, for the review and approval of the CPM, for the unmitigable significant effects that the project will have on U.S. Route 66, and for any other significant effects that the project may have on other significant built-environment resources. Prescriptive treatment plans for construction-related discoveries may also be included in the CRMMP for limited archaeological resource types.
3. Indication of how recovered materials and records will be disposed, taking into account the expressed wishes of the consulting Native Americans.
4. Inclusion of a schedule for providing the consulting Native Americans with periodic updates on implementation of the Treatment Plan.
5. Inclusion of a schedule for completing a final data recovery and discovery report and specify when and to whom this report will be distributed.
6. Inclusion of a curation agreement that ensures that all materials (other than Native American human remains and grave-associated materials) and records are maintained in accordance with 36 CFR Part 79. Materials recovered from privately owned lands, other than Native American human remains and grave-associated materials, that are to be returned to their owners, will be maintained in accordance with 36 CFR Part 79 until their analysis is completed.
7. Specification of the manner in which human remains and grave-associated artifacts recovered during data recovery or discovered during subsequent construction will be treated according to the applicable laws and regulations, and in consultation with the wishes of the consulting Native Americans.

8. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground-disturbance and post-ground–disturbance analysis phases of the project.

9. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

10 A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

11. A description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during ground disturbance, construction, and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from project-related effects.

12. A statement that all encountered cultural resources over 50 years old shall be recorded on Department of Parks and Recreation (DPR) 523 forms and mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, into a retrievable storage collection in a public repository or museum.

13. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.

14. A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resource materials that are encountered during ground disturbance and cannot be treated prescriptively.

15. A description of the contents, format, and review and approval process of the final Cultural Resource Report (CRR), which shall be prepared according to ARMR guidelines.

Verification: Upon approval of the CRS proposed by the project owner, the CPM will provide to the project owner an electronic copy of the draft model CRMMP for the CRS.

At least 30 days prior to the start of ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval.

At least 30 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, and data recovery).

Within 90 days after completion of ground disturbance (including landscaping), if cultural materials requiring curation were generated or collected, the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, to accept the cultural materials from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-6 Prior to the start of ground disturbance the project owner shall complete Historic American Landscape Survey (HALS) large-format photographs (with negatives), sketch plan(s), and written documentation of the 9-mile long segment of U.S. Route 66, including its landscape, viewshed, and character-defining features within the project area from the roadway. In total, no more than fifteen negatives will be prepared. The written component shall be equivalent to HALS Level II documentation. Photographs shall be keyed to a locational map, which shall also include any bridges or culverts associated with the road.

The project owner shall ensure that archivally stable original photographs and negatives (HALS Level III), written documentation (HALS Level II) are submitted to the following repositories and agencies for archival storage and public use: California Historical Resources Information System (CHRIS) (to receive the original set), the County of San Bernardino, California Energy Commission, and the Bureau of Land Management. The project owner shall be responsible for any associated curation fees. Documentation may also be submitted to the HALS program for archival storage.

Documentation shall adhere to the established HALS recordation guidelines and be undertaken and completed by a person meeting the U.S. Secretary of Interior's Professional Qualifications Standards for history or architectural history , as published in Title 36, Code of Federal Regulations, part 61 (36 C.F.R., part 61) and a qualified architectural photographer. The resumes of the qualified personnel

and architectural photographer shall include the names and telephone numbers of contacts familiar with their work on referenced projects and demonstrate to the satisfaction of the CPM that the qualified personnel and architectural photographer have the appropriate training and experience to effectively implement this condition. The applicant may undertake the HALS level-photographic and written recordation activities prior to certification. The applicant undertaking such activities would do so, at their own risk, as a means of advantaging their schedule.

The project owner shall submit the final HALS level-photographic and written documentation to the CPM for review and approval. The final written report shall be provided in the format specified by the HALS Level II guidelines and photographic documentation shall be provided in the format specified by HALS Level III guidelines. The applicant may undertake the HALS recordation activities prior to certification. The applicant undertaking such activities would do so, at their own risk, as a means of advantaging their schedule.

The HALS documentation shall be submitted to a local repository, approved by the CPM, to be displayed in an area easily accessible by the public. The display shall include photographs of the project site and include a written history of Route 66 and its significance in the eastern Mojave, to be reviewed and approved by the CPM prior to submission.

Should an agreement document be executed in consideration of the proposed action pursuant to 36 CFR §§ 800.6 or 800.14(b) among the Bureau of Land Management or other Federal agencies, and the California State Historic Preservation Officer, with or without the participation of the Advisory Council on Historic Preservation, and should that document provide for more intensive HALS Level I or II documentation than the requirements set out above, as determined by the CPM, then the applicant shall adhere to the more stringent requirements in the executed agreement document to mitigate the significant effects of the proposed action on US Route 66. The requirements as set out in the executed agreement document, as they apply to US Route 66, shall supersede the lesser requirements set out above and those lesser requirements would have no further force or effect. Should the executed agreement document be amended in such a manner that the mitigation measures for US Route 66 become less stringent than those set out above, as determined by the CPM, or should the agreement document be terminated prior to the complete implementation of the US Route 66 mitigation measures set out in it, then the project owner shall implement all of the above requirements, in addition to any measures set out under the amended agreement document and in addition to any measures that may have been partially completed prior to the termination of said agreement.

Verification: At least 25 days prior to the start of ground disturbance, the project owner shall submit the resume for the qualified personnel and architectural photographer to the CPM for review and approval . CPM review will take no longer than 5 days .

At least 15 days prior to the start of ground disturbance, the project owner shall submit the draft HALS report to the CPM for review and approvalCPM review will take no longer than 5 days.

Within 15 days after the CPM approval of the HALS report, the project owner shall provide documentation to the CPM confirming that copies of the final report have been provided to the CHRIS, and the HALS. CPM review will take no longer than 5 days .

Within 10 days after CPM approval of the HALS report, the project owner shall provide documentation to the CPM confirming that copies of the final report have been provided to CHRIS, County of San Bernardino, and Bureau of Land Management .

At least 60 days prior to the completion of Phase 1 construction, the project owner shall submit-to the CPM for review and approval , the photographs of the project site and written history that is to be submitted to the local repository.

At least 120 days after the completion of Phase 1 construction, the project owner shall submit evidence that the photographs of the project site and written history has been submitted to the local repository .

CUL-7 The project owner shall submit the final Cultural Resources Report (CRR) to the CPM for approval. The final CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The final CRR shall report on all field activities including dates, times and locations, results, samplings, and analyses. All survey reports, Department of Parks and Recreation (DPR) 523 Series forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as appendices to the final CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification: Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and

approval . Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM .

Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the final CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

Within 10 days after CPM approval of the CRR, the project owner shall provide documentation to the CPM confirming that copies of the final CRR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the Tribal Chairpersons of any Native American groups requesting copies of project-related reports.

CUL-8 Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes.
The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;
4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;
5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;
6. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;
7. An informational brochure that identifies reporting procedures in the event of a discovery;

8. An acknowledgement form signed by each worker indicating that they have received the training; and
9. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification: At least 30 days prior to the beginning of ground disturbance, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval.

At least 15 days prior to the beginning of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-9 The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor full time all ground disturbance at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas, to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of ground disturbance for as long as the activities are ongoing. An archaeological monitor shall be made available to observe both the active ground-disturbance/excavation of soils, as well as the disposal of any removed soils. The number of monitors required shall be determined by the CRS. It is anticipated that during the monitoring effort the archaeological monitors will be moving in and around the construction equipment in order to meaningfully inspect the soils. The archaeological monitors shall observe the ground-disturbance and/or soil disposal activities within a close enough distance to reasonably allow for the detection of cultural artifacts and/or features that could potentially be unearthed during construction, no farther away than 50 feet, or as otherwise directed by the CPM.

A Native American monitor shall be invited to monitor ground disturbance , in the presence of an archaeological monitor, in areas where Native American artifacts may be discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project

owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow ground disturbance to proceed without a Native American monitor.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification: At least 15 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.

Monthly, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.

At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.

Daily, as long as no cultural resources are found, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail or in some other form of communication acceptable to the CPM.

At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.

No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the Chairpersons of the Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.

Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-10 The project owner shall grant authority to halt ground disturbance to the CRS, alternate CRS, and the CRMs in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or if younger, determined exceptionally significant by the CPM), or impacts to such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. Monitoring and daily reporting, as provided in other conditions, shall continue during the project's ground-disturbing activities elsewhere. The halting or redirection of ground disturbance shall remain in effect until the CRS has visited the discovery, and all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if

the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for data recovery from any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.

2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.
3. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.
4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

Verification: At least 15 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

Project owner shall submit confidential information to the CPM, only after receiving approval from the BLM.

CUL-11: If human remains are encountered, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made necessary findings as to origin and disposition of the remains

pursuant to Public Resources Code Section 5097.98. The following actions must be taken in the event that human remains are discovered on Federal, private or State land:

1) Stop work immediately and contact the County Coroner must be notified immediately of the find and the BLM archaeologist shall be notified concurrently.

2) The Coroner has two working days to examine human remains after being notified by the responsible person. If the remains are determined to be prehistoric of Native American origin, the BLM will notify the Native American Heritage Commission,

3) The Native American Heritage Commission will immediately notify the person it believes to be the most likely descendent of the deceased Native American. With the permission of the landowner or agency or an authorized representative, the MLD may inspect the site of the discovery; and

4) The most likely descendent makes recommendations to the owner, or representative, for the treatment or disposition, with proper dignity, of the human remains and grave goods.

If the commission is unable to identify a descendent, or the descendent identified fails to make a recommendation, or the landowner rejects the recommendations of the descendent and the mediation provided for in subdivision (k) of Section 5097.94 fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative shall reinter the human remains and items associated with the Native American burial(s) with appropriate dignity on the property in a location not subject to further subsurface disturbance.

D. GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

This section summarizes the record concerning the project's potential effects on geological and paleontological resources. We evaluate whether project-related activities could result in exposure to geological hazards, as well as whether the facility can be designed and constructed so that any such hazard would not impair its proper functioning. Hazards include volcanic eruptions, faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, tsunamis, and seiches. Of these, dynamic compaction, hydrocompaction, subsidence, and expansive soils are geotechnical engineering issues but are not associated with public safety concerns. We also assess whether the project will impact any geologic or mineralogical resources. Finally, we examine whether fossilized remains or trace remnants of prehistoric plants or animals are likely to be present at the site and, if so, whether the project's potential impacts to these resources are adequately mitigated. (Ex. 300, pp. C.4-1 and C.4-2.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Geologic Hazards

The proposed site is located in the central portion of the Mojave Desert. The Mojave Desert is a broad interior region of isolated mountain ranges, which separate vast expanses of desert plains and interior drainage basins. The potential site is located within the structurally defined Eastern California Shear Zone (ECSZ). The property lies on the southwest flank of the Cady Mountains on federal land managed by the BLM. Overall, the site slopes southwest toward the local topographic low at the normally dry Troy Lake. (Ex. 300, p. C.4-7.)

Surface cover at the site consists of Quaternary alluvium and fanglomerate composed of sediments washed down from the Cady Mountains to the northeast. Small outcrops of Tertiary basalt, andesite, and volcanic breccia occur in the northernmost portion of the site. A small outcrop of basalt flow from the geologically recent Pisgah Crater eruption is present along the southernmost site boundary. (Ex. 300, p. C.4-7.)

Earthquakes are the main geologic hazard at this site. (Ex. 300, p. C.4-7) Thirty-two type A and B faults and fault segments lie within 80 miles of the site.[1] Of these faults, the Lavic Lake and Pisgah-bullion fault zones are in close proximity to the proposed project site. Both of these faults are designated Alquist-Priolo Earthquake Fault Zones. These faults are subparallel Type B fault systems that extend beneath the southern portions of the site. Project site layouts do not show any occupied structures within 50 feet (the required minimum setback) of either fault. However, to address concerns about these faults, we adopt Condition of Certification **GEO-1** that requires evaluation of the Pisgah and Lavic Lake faults by a qualified geologist. (Ex. 300, p. C.4-11.)

Two earthquakes have recently been recorded in or near the project area. The Hector Mine M_w 7.1 earthquake (1999) occurred 18 miles south of the project site and caused no damage to the project area, but some minor damage at Interstate Highway 40. The unnamed M_w 5.1 earthquake (2008) occurred within the project boundaries. These earthquakes show the proposed site could be subject to intense levels of earthquake-related ground shaking in the future. (Ex. 300, p. C.4-11.)

The site soil class is seismic Class C, and Applicant's site-specific analysis indicates that the estimated peak horizontal ground acceleration for the power plant is 0.5 times the acceleration of gravity (0.5g) for bedrock acceleration based on a two percent probability of exceedance in 50 years. (Ex. 300, p. C.4-11.)

The evidence establishes that, assuming compliance with the required design standards set forth in the **Facility Design** section of this Decision, the potential is low for geologic hazards to impact the project during its practical design life. (Ex. 300, pp. C.4-1, C.4-7.) Proposed Condition of Certification **GEO-1** requires that the Pisgah and Lavic Lake faults be located and evaluated in the field so that proper setbacks can be assured for occupied structures. Further, the project owner will implement additional fault and geologic hazards measures as part of the final project design, as required by the California Building Code (CBC). (Ex. 300, p. C.4-7.) Therefore, we adopt Condition of Certification **GEO-1** to address the potential for geology related impacts.

[1] These are identified in Exhibit 300, **Table 2**, p. C.4-9. Type A faults have slip-rates of $\geq$5 millimeters per year (mm/year) and are capable of producing an earthquake of magnitude 7.0 or greater. Type B faults have slip-rates of 2 to 5 mm per year and are capable of producing an earthquake of magnitude 6.5 to 7.0.

The deep groundwater table (over 300 feet down) indicates no potential for liquefaction. Because the proposed Calico Solar Project site is not subject to liquefaction, there is no potential for lateral spreading during seismic events. (Ex. 300, p. C.4-12.) Site specific geotechnical investigation indicates that the site's underlying subsurface alluvial deposits are too dense to allow significant hydrocompaction or dynamic compaction. (Ex. 300, p. C.4-12.)

The dense alluvial deposits and the absence of petroleum, natural gas, or water withdrawals at the site minimize the possibility of subsidence. (Ex. 300, p. C.4-12.)

The alluvium and volcanic rocks that form the site subsurface are not considered to be expansive. However, expansive clays encountered at depth in soil borings can be mitigated by standard engineering design. (Ex. 300, p. C.4-13.)

Landslides, tsunamis, and seiches similarly pose insignificant risks. (Ex. 300, p. C.4-13.)

The project includes approximately 12 detention basins that will intercept stormwater on the north side of the site. The down-slope sides of the detention basins will require an engineered embankment up to approximately 15 feet high and a spillway. (Ex. 300, C.4-6.) Because the proposed site is topographically elevated above terrain to the south and west, the potential for flooding at the site is limited to infrequent high volume (flash flood) events due to heavy rainfall in the adjacent Cady Mountains. If flash flooding occurs it will primarily affect the drainages that cross the site (northeast to southwest), and the record indicates that overbank flow is not expected to occur. The proposed detention basins along the northern (upslope) site border will minimize the potential for flash flood damage to the project. Proposed Conditions of Certification **GEO-2** and **GEO-3** will ensure that detention basins and detention dams (as defined by DWR) are designed in accordance with current regulations and standards. Therefore, we find that the likelihood of catastrophic flooding at the proposed project site is low. Application of civil engineering design standards will minimize the potential for flash flood damage. (Ex. 300, p. C.4-13; see also, **Soil and Water Resources** section of this Decision.)

The proposed Calico Solar Project site is located immediately northwest of the Sleeping Beauty volcanic area. The Sleeping Beauty area is part of the regional Amboy Crater – Lavic Lake volcanic hazard area, an approximately 6,000 square mile area within the Mojave Desert. The proposed Calico Solar Project lies in an area, which has been and may again be subjected to ash and cinder falls associated with nearby vents. However, a recurrence of these eruptions from vents in the Amboy Crater – Lavic Lake hazard area has not been predicted, and

is estimated to be in the range of 1,000's of years or more. Therefore, based on the evidence in the record, we find that there is a low likelihood of volcanic activity that may affect operation of the proposed Calico Solar Project. Eruptive activity would likely be limited to ash fall, which would have a minor, short-lived affect on the project. This would involve having to shut down and probably cover the generators to prevent damage from the abrasive ash and having to clean the mirrors once the eruption was over. Mirrors will need to be cleaned periodically as part of normal plant operation and maintenance. (Ex. 300, p. C.4-13.)

Therefore, we find that the design-level geotechnical investigation, required for the project by the CBC (2007) and proposed Condition of Certification **GEN-1** will provide standard engineering design recommendations for mitigation of earthquake ground shaking and excessive settlement (see Proposed Conditions Of Certification, **Facility Design**).

2. Mineralogic and Paleontologic Impacts

The proposed Calico Solar Project is not located within an established Mineral Resource Zone and no economically viable mineral deposits are known to be present. Several operating and closed mines and mineral prospects are present within five miles of the proposed project boundaries. These have produced a number of industrial minerals, primarily manganese, borates, clay, and talc. No active mines are known to have existed within the proposed project boundaries (Ex. 300, p. C.4-14).

The evidence shows that Staff reviewed the Applicant's paleontological resources assessment and the confidential paleontological resources report. (Exs. 1, § 5.8 and Appen. H; 300, p. C.4-14.) Staff has also reviewed paleontological literature and records searches conducted by the Natural History Museum of Los Angeles County. These studies indicate the Quaternary alluvium, fanglomerate, and volcanic rocks within and near the proposed project site contain few fossils. Older Quaternary alluvium, which underlies the site at uncertain depth, may contain significant fossil vertebrates. (Ex. 300, p. C.4-15)

Construction will include grading, foundation excavation, and utility trenching. Unauthorized, unmonitored ground disturbances in these areas could potentially damage paleontologic resources. We adopt Conditions of Certification **PAL 1** to **PAL 7** to mitigate paleontological resource impacts. These Conditions require a worker education program in conjunction with the monitoring of earthwork activities by a professional paleontologist.

Based upon the literature and archives search, field surveys, and compliance documentation for the Calico Solar Project, the Applicant has proposed monitoring and mitigation measures to be followed during the construction of the project. We find that the facility can be designed and constructed to minimize the effect of geologic hazards and impacts to potential paleontological resources at the site during project design life. (Ex. 300, p. C.4-15.)

Construction and Operation of the proposed new solar energy generating facility will not have any adverse impact on geologic, mineralogic, or paleontological resources. In addition, the future decommissioning and closure of the proposed project will not negatively affect geologic, mineralogic, or paleontological resources since the ground disturbed during plant decommissioning and closure would have been already disturbed, and mitigated as required in this Decision. (*Id.*)

3. Cumulative Impacts

The Cumulative analysis includes other renewable energy projects and foreseeable future projects in the immediate Newberg Springs/Ludlow area. The geographic area considered for cumulative impacts on geology and paleontology is the central portion of the Mojave Desert, more specifically, San Bernardino and Riverside Counties. The potential impacts are limited to those involving paleontological resources since no geological or mineralogical resources have been identified within the boundaries of the proposed project. There are no geological hazards with potential cumulative effects, other than regional subsidence from ground water withdrawal. Significant ground water withdrawal is not part of the proposed project. (Ex. 300, p. C.4-26.)

Construction of the proposed Calico Solar Project would require localized excavation or ground disturbance over a very large area. Because the project area lies within geologic units with moderate to high paleontological sensitivity, the required excavation could, potentially, damage paleontological resources. Any damage could be cumulative to damage from other projects within the same geological formations. Implementation and enforcement of a properly designed Paleontological Resource Monitoring and Mitigation Plan (Condition of Certification **PAL-3)** will result in a net gain to the science of paleontology by allowing fossils that would not otherwise have been found to be recovered, identified, studied, and preserved. Therefore, the evidence indicates that cumulative impacts from the Calico Solar Project, in consideration with other

nearby similar projects, will be either neutral (no fossils encountered) or positive (fossils encountered, preserved, and identified). (Ex. 300, p. C.4-28.)

Operation of the Calico Solar Project will not affect paleontological resources, and will not increase potential cumulative effects on paleontological resources. The longer the plant operates, however, the more likely it is to be damaged by hazards, primarily earthquake-related ground shaking. Construction and operation of the plant does not increase the potential for geological hazards at the site. The decommissioning of the Calico Solar Project will also not result in adverse geology or paleontology impacts. (*Id.*)

4. Compliance with Laws, Ordinances, Regulations and Standards (LORS)

Federal, state, or local/county LORS applicable to this project or alternatives are detailed in **Appendix A** of this Decision. The evidence shows that the project will comply with applicable LORS.

5. Public and Agency Comments

One agency comment was received relating to Geology and Paleontology. The County of San Bernardino, Land Use Service Department, requested additional discussion of the Lavic Lake fault that partially underlies the project site. Additional descriptive information was added in the Staff Assessment to address this comment. To further address this comment, Condition of Certification **GEO-1** was identified to require detailed geologic and field evaluation of both the Pisgah and Lavic Lake faults.

FINDINGS OF FACT

Based on the uncontroverted evidence, we make the following findings:

1. The project is located in an active geologic area.

2. Ground shaking, flash flooding, and volcanic activity are the main geologic hazards, which could affect the Calico Solar Project.

3. Potential geologic hazards to the project are effectively mitigated by standard engineering design measures as specified in Conditions **GEN-1, GEN-5,** and **CIVIL-1** of the **Facility Design** section of this Decision. Hazards from volcanic activity would be short-term and limited to ashfall.

4. There is some potential for fault rupture along two mapped active faults that underlie the project site. Condition of Certification **GEO-1** requires that the faults be located and evaluated so that occupied structures can be properly setback from these faults and their splays.

5. The project includes detention basins to intercept stormwater on the north side of the project site. Conditions of Certification **GEO-2** and **GEO-3** ensure that the detention basins are designed in accordance with current regulations and standards.

6. Liquefaction, lateral spreading, dynamic compaction, hydrocompaction, ground subsidence, landslides, tsunamis, and seiches pose low or negligible project risks.

7. There is no evidence of existing or potential geological or mineralogical resources at the project site or along the linear alignments.

8. The evidence addresses the potential cumulative impacts of the project in conjunction with other renewable energy and foreseeable future projects identified in San Bernardino and Riverside Counties.

CONCLUSIONS OF LAW

1. The Conditions listed below ensure that project activities will not cause significant adverse direct or cumulative impacts to geological, mineralogical, or paleontological resources.

2. Compliance with the Conditions of Certification specified below will ensure that the Calico Solar Project conforms to all applicable laws, ordinances, regulations, and standards identified in **Appendix A** of this Decision.

CONDITIONS OF CERTIFICATION

GEO-1 The two Alquist-Priolo faults (Pisgah fault and the Lavic Lake fault) shall be located (if actually present) by trenching or suitable geophysical methods with sufficient accuracy and confidence to assure that no occupied structures are placed within 50 feet, either side, of an established fault trace or any identified splays. Other structures deemed critical to the project, by the owner, may also be set back, as practical, prudent and appropriate. [

Verification: At least 30 days prior to ground breaking (prior to final project design) the project owner shall submit a fault evaluation report signed and stamped by a geologist licensed in the state of California. The evaluation shall

include sufficient field exploration to establish whether or not either or both faults (or their splays) extend onto the project site. Surveyed locations shall be obtained for any faults encountered and a map showing the fault locations in relation to project structures shall be provided. Onsite faults shall be considered active unless conclusive field evidence shows otherwise.

GEO-2 Because of the embankments on the downhill side, the proposed storm water detention basins constitute detention dams, some of which may be large enough to be under the jurisdiction of the State of California, Department of Water Resources, Division of Safety of Dams. Each detention dam site shall be characterized in a geotechnical investigation to establish foundation conditions and assess geologic hazards that affect embankment design. Appropriate geotechnical recommendations shall be provided for use in design and construction of the embankments and the associated storage area. All dams must be designed by a California licensed geotechnical or civil engineer familiar with design of small dams.

Verification: At least 60 days prior to ground breaking for the detention basins, the project owner shall submit a geotechnical investigation report covering each proposed detention basin. Appropriate geotechnical recommendations and specifications shall be provided for use in design and construction of the embankments and the associated storage area. All detention facilities can be included in a single report or in the overall final project geotechnical report. One set of stamped design drawings, typical of the detention dams, must be submitted by the project owner, prior to starting detention dam construction.

GEO-3 The California Department of Water Resources, Division of Safety of Dams has jurisdiction over proposed and existing dams that impound 50 acre-feet of water or more. Embankments six feet high or less are excluded, regardless of storage capacity and embankments impounding less than 15 acre-feet of water are excluded, regardless of height. Any detention basin meeting the Division of Safety of Dams jurisdictional criteria for a dam shall be permitted through that agency.

Verification: If final detention basin design results in no jurisdictional dams, the project owner shall submit a letter of verification from the design engineer. If one or more detention basins fall within the jurisdiction of the Division of Safety of Dams, the project owner shall submit copies of the permit application(s) to the Division of Safety of Dams. Upon completion of construction of jurisdictional dams, the project owner shall submit copies of acceptance documents from the Division of Safety of Dams.

PAL-1 The project owner shall provide the Compliance Project Manager CPM with the resume and qualifications of its paleontological resource specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the

Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified paleontological resource monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. Institutional affiliations, appropriate credentials, and college degree;
2. Ability to recognize and collect fossils in the field;
3. Local geological and biostratigraphic expertise;
4. Proficiency in identifying vertebrate and invertebrate fossils; and
5. At least three years of paleontological resource mitigation and field experience in California and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontological resource monitors (PRM) shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year of experience monitoring in California; or
- AS or AA in geology, paleontology, or biology and four years' experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project, stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the Condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the

CPM. The letter shall be provided to the CPM no later than one week prior to the monitor's beginning on-site duties.

Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction lay-down areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale between 1 inch = 40 feet and 1 inch = 100 feet. If the footprint of the project or its linear facilities changes, the project owner shall provide maps and drawings reflecting those changes to the PRS and CPM.

If construction of the project proceeds in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Before work commences on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked the following week and until ground disturbance is completed.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings to the PRS and CPM.

If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ground disturbance.

If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3 The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a PRMMP to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities and may be modified with CPM approval. This document shall be used as the basis of discussion when on-site decisions or

changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the SVP (1995) and shall include, but not be limited, to the following:

1. Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;
2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the Conditions of Certification;
3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;
5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;
6. A discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;
7. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;
9. Identification of the institution that has agreed to receive data and fossil materials collected, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and

10. A copy of the paleontological Conditions of Certification.

Verification: At least 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction activities involving ground disturbance, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for the following workers: project managers, construction supervisors, foremen, and general workers involved with or who operate ground-disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of an initial in-person PRS training during the project kick off for those mentioned above. Following initial training, a CPM-approved video or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or other areas of interest or concern. No ground disturbance shall occur prior to CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Good quality photographs or physical examples of vertebrate fossils for project sites containing units of high paleontological sensitivity;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A WEAP certification of completion form signed by each worker indicating that he/she has received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP, including the brochure, with the set of reporting procedures for workers to follow.

At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning to use a video for interim training.

If the owner requests an alternate paleontological trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.

In the monthly compliance report (MCR), the project owner shall provide copies of the WEAP certification of completion forms with the names of those trained and the trainer or type of training (in-person or video) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and will be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.
2. The project owner shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
3. The project owner shall ensure that the PRS notifies the CPM within 24 hours of the occurrence of any incidents of non-compliance with any **Paleontological Resources** Conditions of

Certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.

4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours, or Monday morning in the case of a weekend event, where construction has been halted because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the monthly compliance reports. The summary will include the name(s) of PRS or PRM(s) active during the month; general descriptions of training and monitored construction activities; and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontological monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during project construction.

Verification: The project owner shall maintain in his/her compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after project completion and approval of the CPM-approved paleontological resource report (see Condition of Certification **PAL-7**). The project owner shall be responsible for paying any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and submit it to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated below the level of significance.

Verification: Within 90 days after completion of ground-disturbing activities, including landscaping, the project owner shall submit the PRR under confidential cover to the CPM.

Certification of Completion
Worker Environmental Awareness Program
Calico Solar Project (08-AFC-13)

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on cultural, paleontological, and biological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.			
2.			
3.			
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Cultural Trainer: _____ Signature:_____ Date: ___/___/___

PaleoTrainer:_____ Signature:_____ Date: ___/___/___

Biological Trainer: _____ Signature:_____ Date:___/___/___

VII. LOCAL IMPACT ASSESSMENT

The effect of a power plant project on the local area depends upon the nature of the community and the extent of the associated impacts. Technical topics discussed in this portion of the Decision consider issues of local concern including **Land Use, Noise, Socioeconomics, Traffic and Transportation, and Visual Resources.**

A. LAND USE

SUMMARY AND DISCUSSION OF THE EVIDENCE

Because the Calico Solar Project is subject to meet the requirements of both NEPA and CEQA, the methodology used for determining environmental impacts of the proposed project includes a consideration of guidance provided by both laws and NEPA Implementing Regulations (40 CFR Parts 1500-1508). Thresholds for determining significance in this section are based on Appendix G of the CEQA Guidelines (CCR 2006) and performance standards or thresholds identified by Energy Commission staff. In addition, environmental effects of the proposed project on land uses (i.e., those listed below) includes an assessment of the context and intensity of the impacts, as defined in the CEQA and NEPA Regulations, 40 CFR Part 1508.27. Effects of the proposed project on the land uses and the environment (and in compliance with both CEQA and NEPA) have been determined using the thresholds listed below.

<u>Agricultural Lands and Rangeland Management</u>

- Conversion of Farmland or Rangeland.
- Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.
- Conflict with existing zoning for agricultural use, or a Williamson Act contract.
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural uses.

Wilderness, Areas of Critical Environmental Concern (ACEC) and Recreation

- Directly or indirectly disrupt activities in established federal, state, or local recreation areas and/or wilderness areas.
- Substantially reduce the scenic, biological, cultural, geologic, or other important factors that contribute to the value of federal, state, local, or private recreational facilities or wilderness areas.

Horses and Burros

- Involve changes in the existing environment which, due to their nature or location, result in interference with BLM's management of Herd Management Areas (HMAs).

Land Use Compatibility and LORS Compliance

- Directly or indirectly divide an established community or disrupt an existing or recently approved land use.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction, or that would normally have jurisdiction, over the project adopted for the purpose of avoiding or mitigating environmental effects.

The majority of the Calico Solar Project site is located within the "Moderate Use" category of the BLM's CDCA Plan, with some areas designated as "limited" (Class L). (Ex. 300, p. C.8-10.Z) **LAND USE Table 1** provides a general description of the land use LORS applicable to the proposed project.

Land Use Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	
Federal Land Policy and Management Act (FLPMA), 1976 – 43 CFR 1600	Establishes public land policy; guidelines for administration; and provides for the management, protection, development, and enhancement of public lands. In particular, the FLPMA's relevance to the proposed project is that Title V, Section 501 establishes BLM's authority to grant rights-of-way for generation, transmission, and distribution of electrical energy (FLPMA 2001).
Bureau of Land Management -California Desert Conservation Area (CDCA) Plan, 1980 as Amended (BLM 1980)	The 25 million-acre CDCA contains over 12 million acres of public lands spread within the area known as the California Desert, which includes the following three deserts: the Mojave, the Sonoran, and a small portion of the Great Basin. The 12 million acres of public lands administered by the BLM are half of the CDCA. The CDCA Plan is a comprehensive, long-range plan with goals and specific actions for the management, use, development, and protection of the resources and public lands within the CDCA, and it is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The plan's goals and actions for each resource are established in its 12 elements. Each of the plan elements provides both a desert-wide perspective of the planning decisions for one major resource or issue of public concern as well as a more specific interpretation of multiple-use class guidelines for a given resource and its associated activities.

Applicable LORS	Description
Public Rangelands Improvement Act (1978) (PRIA 1978)	Establishes and reaffirms the national policy and commitment to inventory and identify current public rangeland conditions and trends; manage, maintain and improve the condition of public rangelands so that they become as productive as feasible for all rangeland values in accordance with management objectives and the land use planning process; and continue the policy of protecting wild free-roaming horses and burros from capture, branding, harassment, or death, while at the same time facilitating the removal and disposal of excess wild free-roaming horses and burros which pose a threat to themselves and their habitat and to other rangeland values.
Wild and Free-Roaming Horse and Burro Act (1971) (BLM 2009j)	The BLM protects, manages, and controls wild horses and burros under the authority of the Wild Free-Roaming Horses and Burros Act of 1971 (Act) to ensure that healthy herds thrive on healthy rangelands. The BLM manages these animals as part of its multiple-use mission under the 1976 Federal Land Policy and Management Act. One of the BLM's key responsibilities under the Act is to determine the "appropriate management level" (AML) of wild horses and burros on the public rangelands.
State	
None	
Local	
County of San Bernardino 2007 General Plan (CSB 2007a)	The policies and programs of the County of San Bernardino General Plan, adopted March 13, 2007, are intended to serve as a blueprint for most land use decisions. Preparing, adopting, implementing, and maintaining a general plan serves to: identify the community's land use, transportation, environmental, economic, and social goals and policies as they relate to land use and development; form the basis for local government decision-making, including decisions on proposed development; provide residents with opportunities to participate in the planning and decision-making processes of their community; and inform residents, developers, decision makers, and other cities and counties of the ground rules that guide development within the community.
County of San Bernardino 2007 Development Code, Title 8 of the San Bernardino County Code (CSB 2007b; CSB 2010d)	San Bernardino County has adopted a "one-map approach" for both the General Plan land use designations and zoning classifications to assure land use consistency between the General Plan and Development Code. The Development Code was adopted March 13, 2007, and amended August 20, 2009 and February 2010. The purpose of this Development Code is to implement the San Bernardino County General Plan by classifying and regulating the uses of land and structures within unincorporated San Bernardino County. In particular, the purposes of the Development Code are as follows: to provide standards and guidelines for continuing orderly growth and development; to conserve and protect the County's important agriculture, cultural, natural, open space and scenic resources; to create a comprehensive and stable pattern of land uses upon which to plan transportation, water supply, sewerage, energy, drainage/flood control and other public facilities and utilities; to encourage the most appropriate uses of land in order to prevent overcrowding of land and avoid undue concentration of population, and maintain and protect the value of property; and to ensure compatibility between different types of development and land use. The Development Code was most recently amended on February 9, 2010, to include Chapter 84.29 (Renewable Energy Generation Facilities) for the purpose of establishing "...standards and permit procedures for the establishment, maintenance and decommissioning of renewable energy generation facilities" (CSB 2010).

(Ex. 300, pp. C.684 to C.8-5.)

1. The Site

The proposed Calico Solar site is approximately 4,613 acres and is located in San Bernardino County approximately 37 miles east of Barstow. The site consists primarily of public land administered by the BLM. Within the site boundaries are 2,246 acres of undeveloped private land under the jurisdiction of San Bernardino County; however, the private land would not be a part of the proposed project. This private land, as well as non-BLM lands within 1 mile of the project, is designated as Resource Conservation by county zoning. The southern boundary of the proposed project site is adjacent to Interstate Highway 40 (I-40), and the northern side of the project site borders the Cady Mountains. (Ex. 300, p. C.8-6.)

The Calico Solar site primarily consists of undeveloped desert land. Existing onsite land uses include the Burlington Northern Santa Fe (BNSF) railroad right-of-way (ROW), which traverses the site from east to west; several underground high pressure gas pipelines generally parallel to I-40 and the railroad; Hector Road which enters the site from I-40 and traverses it for approximately 0.5 mile; and Southern California Edison's (SCE) Pisgah Substation and overhead transmission line which are adjacent to the southeast border of the project site. In addition, approximately 775 acres on the northeast portion of the original project site (i.e., the original 8,230-acre project site proposed in the AFC) are designated as Land and Water Conservation Fund (LWCF) mitigation lands. Based on the evidence, it appears that LWCF lands are located within the revised project site boundary. However, the exact acreage of the affected LWCF lands within the proposed project site boundary has not been provided by the applicant. (Ex. 300, p. C.8-6.)

The proposed project would occur in two phases. Phase I would consist of the construction of up to 11,000 SunCatchers and would require approximately 2,327acres of BLM land. Phase II would expand the project to a total of 34,000 SunCatchers and would require approximately an additional 3,888 acres of BLM land. In addition to the proposed project site and construction areas, there are other features and facilities associated with the proposed project (the majority of which are located on the proposed project site or construction laydown areas), including:

- approximately 26,450 38-foot solar dish Stirling systems (i.e., SunCatchers) and associated equipment and infrastructure within a fenced boundary;
- a 220-kV substation in the center of the project site;

- approximately 1 mile within the project site of twelve to fifteen 220-kV transmission line structures (90 to 110 feet tall) from the proposed Calico Solar Substation to SCE's Pisgah Substation;
- a Main Services Complex including an administration building (30,000 sq. ft.) and a maintenance building (45,000 sq. ft.);
- two 175,000-gallon water storage tanks (40 feet in diameter) and two 17,000-gallon water storage tanks (18 feet in diameter);
- main roads with a combination of roadway dips and elevated sections across drainage features;
- a buried septic tank system with a dual sanitary leach field; and
- permanent access to the project site to be provided by a bridge over the BSNF railroad along Hector Road.

2. Potential Impacts

Agricultural Lands and Rangeland Management. The project site is located within the desert region of central San Bernardino County, which is not notable for productive agricultural land. The United States Department of Agriculture's (USDA) Natural Resource Conservation Service (NRCS) provides information on the designation of soils in areas with agricultural lands, including farmland classifications such as Prime Farmland and Farmland of Statewide Importance. However, data for the project site was not available through the NRCS's Web Soil Survey (WSS). Similarly, the California Department of Conservation's (DOC) Farmland Mapping and Monitoring Program (FMMP) provides designations and statistics on the conversion of farmland to non-agricultural uses throughout the State. However, the proposed project site is not within the survey boundaries of the FMMP. As such, no agricultural land is within the project boundaries. (Ex. 300, p. C.8-8.)

Rangeland allotments are designated BLM pastures for wildlife and livestock. The majority of the proposed project is located within the Cady Mountains rangeland allotment. According to BLM's online GIS mapping program (Geocommunicator), the southwest boundary of this allotment follows the BNSF railroad. As such, approximately 6,400 acres of the project site that is north of the BNSF railroad is within the Cady Mountains rangeland allotment (BLM 2009c). There is currently no grazing permit issued within the proposed project area. In addition, the northern boundary of the Ord Mountain allotment is approximately 0.75 mile south of the project site. (Ex. 300, p. C.8-8.)

Based on the lack of federal, state or local farmland/agricultural designations, the proposed project would not convert important farmland, would not conflict with agricultural zoning designations or Williamson Act contracts, and would not result in a change in the existing environment that would lead to a conversion of farmland. Therefore, the proposed project would not adversely impact agricultural land. (Ex. 300, p. C.8-11.)

The project would be located within the Cady Mountains grazing allotment. This allotment consists of 177,293 acres which is designated by BLM as available for grazing livestock. According to the West Mojave Plan, the allotment was identified as an area that would benefit from voluntary relinquishment. Therefore, grazing is not currently authorized on this allotment. The proposed project would convert approximately 6,400 acres of the Cady Mountains rangeland allotment to another use, which accounts for approximately 3 percent of the allotment. Therefore, the proposed project is not expected to result in an adverse impact to inactive livestock grazing. For discussion of impacts to the desert bighorn sheep, please see the **Biological Resources** section of this Decision. (Ex. 300, p. C.8-11.)

Wilderness and Recreation. Recreational activities, including camping and off-road vehicle use, are permitted in the Cady Mountains Wilderness Study Area (WSA) located just north of the project site. In addition, the project would be approximately 8 miles north of the closest wilderness area (the Rodman Mountains). As such, the proposed project would not directly disrupt wilderness or recreation activities. However, the proposed project could indirectly impact the recreational and wilderness values of the Cady Mountains WSA by changing the natural and undisturbed landscape; and construction and operation activities would have the potential to degrade the qualities of solitude and unconfined wilderness and recreation in this remote area of the Mojave Desert. The CDCA Plan amendment associated with the proposed project would not affect the wilderness characteristic values of the WSA since the proposed project site is not located within the WSA area. The evidence shows that numerous wilderness and recreation areas are in the vicinity of the project site which provide alternative options for recreation and wilderness destinations. Therefore, potential indirect impacts from the proposed project would not be adverse from a land use perspective. Please refer to the **Biological Resources**, **Cultural Resources**, and **Visual Resources** sections of this Decision for detailed discussions of proposed project effects on scenic, biologic, and cultural amenities. (Ex. 300, p. C.8-11.)

Horses and Burros. The proposed project would not contain or traverse any established BLM Herd Areas (HAs) or Herd Management Areas (HMAs). The Granite-Providence HA is the closest HA, which is located approximately 32 miles east side of the proposed project site. Therefore, the proposed project would not result in an interference with BLM's management of an HMA or HA. (Ex. 300, pp. C.8-9 to C.8-10.)

Division of Existing Community. The proposed project site is located on undeveloped lands under the jurisdiction of the BLM, which is not located within or near an established community. Therefore, neither the size nor the nature of the project would result in a physical division or disruption of an established community. In addition, due to the temporary nature of construction activities, construction generated nuisances such as dust and noise are not expected to adversely affect existing land uses in the area. For a detailed analysis of construction-related nuisance impacts, please see the **Air Quality, Public Health, Traffic and Transportation,** and **Noise** sections of this Decision**.** (Ex. 300, p. C.8-12.)

3. Consistency with Land Use LORS.

As required by California Code of Regulations, Title 20, Section 1744, Energy Commission staff evaluates the information provided by the project owner in the AFC (and any amendments), project design, site location, and operational components to determine if elements of the proposed project would conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, or that would normally have jurisdiction over the project except for the Energy Commission's exclusive authority.

The Applicant has submitted an application to the BLM requesting a ROW to construct the proposed project and its related facilities. Pursuant to the California Desert Conservation Area (CDCA) Plan, sites associated with power generation or transmission not identified in the CDCA Plan are considered through the Plan Amendment process. Under Federal law, BLM is responsible for processing requests for ROWs to authorize such proposed projects and associated transmission lines and other appurtenant facilities on land it administers. The CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission not identified in the Plan be considered through the Plan Amendment process. BLM would use the following Planning Criteria during the Plan Amendment process:

- The plan amendment process would be completed in compliance with the Federal Land Policy and Management Act (FLPMA), NEPA, and all other relevant Federal law, executive orders, and management policies of the BLM;
- The plan amendment process would include an EIS to comply with NEPA standards;
- Where existing planning decisions are still valid, those decisions may remain unchanged and be incorporated into the new plan amendment;
- The plan amendment would recognize valid existing rights;
- Native American Tribal consultations would be conducted in accordance with policy, and Tribal concerns would be given due consideration. The plan amendment process would include the consideration of any impacts on Indian trust assets (please see the **Cultural Resources** section of this Decision);
- Normally, consultation with the State Office of Historic Preservation (SHPO) would be conducted throughout the plan amendment process. At the time of the writing of this SSA, it appears that the BLM may address cultural resources issues through the BLM's Statewide Protocol, whereby BLM does not conduct a public section 106 process or SHPO consultation (please see the **Cultural Resources** section of this Decision for details regarding this issue); and
- Consultation with the US Fish and Wildlife Service (USFWS) would be conducted throughout the plan amendment process (please see the **Biological Resources** section of this Decision). (Ex. 300, pp. C.8-12 to C.8-13.)

If the ROW and proposed land use plan amendment are approved by BLM, the proposed solar thermal power plant facility on public lands would be authorized in accordance with Title V of the FLMPA of 1976 and the Federal Regulations at 43 CFR Part 2800. The BLM's Environmental Impact Statement (EIS) acts as the mechanism for meeting NEPA requirements, and also provides the analysis required to support a Plan Amendment identifying the site location within the Plan. (Ex. 300, p. C.8-13.)

An additional LORS compliance issue was raised by the public during the scoping process for this document. According to some private landowners, the public and private landowners have been using Hector Road at the railway crossing to access the land north of the BNSF railway for over fifty years. This includes the private properties in Section 1, Township 8 North, Range 5 East, and Section 36, Township 9 North, Range 5 East. However, according to these private landowners, recently-placed gates and barricades at the crossing have blocked access to these lands. Private landowners assert that Hector Road has

been in use prior to the passage of the FLPMA, and therefore, is a county road, and blocking access is a violation of the Unlawful Enclosures of Public Lands Act of 1885 and the CDCA Plan, which classifies the project site as an “open area.” (Ex. 300, p. C.8-13.)

As the proposed project developer, Tessera Solar responded to the private landowners by explaining that due to additional safety requirements, BNSF requires gates to be installed at all crossings where an entity other than BNSF (i.e., the Applicant) would have access. The private crossing granted to Calico Solar/Tessera is for the purposes of establishing an access to the western side of the proposed project site. As such, in addition to installation of the gate and barricades, the Applicant had to acquire insurance for potential damage to BNSF property and attend a safety course. Tessera complied with these conditions and was granted access, which established the need for gates and barricades. In addition, BLM representatives stated that the crossing was established as a BNSF ROW for access to, and maintenance of, the rail line and, and therefore, the crossing is not a legal road with authorized access for the public. As such, the crossing is a physical access and not a legal access, and has been used in a passive and unauthorized manner. Therefore, the recent blockage of this crossing does not result in a conflict with any applicable LORS. The issue appears to be a private dispute, not amenable to resolution by this Commission. We note that the private landowners have not cited any authority under which the Energy Commission could act to resolve their dispute. (Ex. 300, p. C.8-13.)

As the proposed project would be located solely on BLM-administered land, there are no state, regional, county, or other local land use LORS applicable to the proposed project. Staff’s analysis of the proposed project’s consistency with applicable federal land use LORS is presented in **LAND USE Table 2** at the end of this section. Based on Staff’s independent review of applicable LORS documents, the proposed project would not be consistent with certain applicable land use LORS; in particular the current BLM Interim Policy Memorandum regarding LWCF mitigation lands (see discussion in the table below). (Ex. 300, p. C.8-14.)

4. Cumulative Impacts

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects,

and the effects of probable future projects [Cal. Code Regs., title 14, § 15065(a)(3)].

Agricultural Lands and Rangelands

Although, the proposed project by itself would not convert agricultural land to nonagricultural uses, the conversion of lands due to past and present projects, and the potential development of the approximately one million acres of land, would all combine to result in adverse effects on agricultural lands (one of the state's most important resources) and rangeland. Therefore, although the development of renewable resources in compliance with federal and State mandates is important and required, this conversion would contribute to a significant and unavoidable cumulative impact to agricultural resources. (Ex. 300, p. C.8-34.)

Wilderness and Recreation

In addition to the proposed Calico Solar facility, there are many past, present, or reasonably foreseeable future actions that contribute to impacts to recreation and wilderness areas. Regionally, there have been both positive and negative impacts to recreational and wilderness resources as a result of development projects within San Bernardino County. Development of highway access to the region has provided direct vehicular access to open desert scenery for residents throughout southern California. This increased access has improved the recreational experience for some users by making the area more accessible, but has also detracts from the recreational experience for other users who prefer remote camping, hiking, and hunting away from populated areas.

Presently, as noted above, numerous energy-related development projects, including the proposed project, would remove large acreages of land from potential recreational use, and would have adverse effects on the viewscape that would result in some users seeking out other areas of the desert for their activities (see the cumulative analysis in the **Visual Resources** section of this Decision). Similarly, within wilderness areas, the attraction of hiking, camping, and other outdoor activities is likely to decrease due to the increased human activity in the region, and the consequent impact of development on the viewscape. The proposed project would permanently change the nature of land use at the proposed project site from Government Special Public Limited Use and Moderate Use to an intensive utility use for the generation of power. Therefore, the combined effect of the overall cumulative past, present, and proposed and reasonably foreseeable projects, including the proposed project, in

the desert region of San Bernardino County would adversely affect recreation and wilderness resources, resulting in a significant and unavoidable impact under CEQA. (Ex. 300, pp. C.8-36 to C.8-37.)

Horses and Burros

Although the proposed Calico Solar facility would not adversely impact horses or burros, there are other present or reasonably foreseeable future actions that could contribute to impacts to HMAs within the region. Authorized and unauthorized vehicle use, and maintenance and construction of utility rights-of-way can have a slight impact to burros by removal of vegetation utilized for forage, and there is always a danger of vehicles colliding with burros. The impact of the proposed and probable development projects would cumulatively remove and isolate potential grazing sites for burros. However, in areas of close proximity to HMAs, development projects would be required to consider impacts related to wild horses and burros. Therefore, cumulative impacts would be less than significant. (Ex. 300, p. C.8-38.)

Land Use Compatibility and LORS Compliance

Proposed developments near the project site that would have the potential to induce cumulative impacts include solar and wind energy generation projects, and the expansion of the existing military base. In consideration of cumulative land use compatibility impacts, the implementation of renewable projects in southern California would occur mostly in undeveloped desert lands or areas of rural development and open space, and therefore, would not create physical divisions of established residential communities. Nonetheless, as noted above, approximately one million acres of land are proposed for solar and wind energy development in the southern California desert lands. The conversion of these lands would preclude numerous existing land uses including recreation, wilderness, rangeland, and open space, and therefore, would result in a significant cumulative land conversion impact. The proposed project's conversion of approximately 6,215 acres in an undeveloped portion of San Bernardino County and on BLM lands in combination with the land conversion impacts of past, present, and reasonably foreseeable future projects in the area would be cumulatively considerable, and a significant and unavoidable impact under CEQA. (Ex. 300, p. C.8-39.)

5. Public Comment

Public comments made on August 4, 2010 on land use are listed below: (8/4/10 RT 214 – 216.)

Fred Stearn, Real Estate Agent representing landowners in Sections 1 and 36, expressed concern about landowners being landlocked by the proposed project and being subjected to potentially significant environmental impacts. His main concern was access to the landowner's properties.

FINDINGS OF FACT

Based on the evidence, the Commission makes the following findings:

1. As the proposed project would be located wholly on BLM administered land, no state, regional, or local land use LORS would be applicable to the project.
2. No farmland or rangeland conversion impacts are expected as a result of the proposed project, and the project would not involve other changes in the existing environment which could result in conversion of farmland to non-agricultural uses.
3. The proposed project would indirectly impact the recreational and wilderness values of the Cady Mountains WSA. However, due to the numerous wilderness and recreation areas throughout the county and in the vicinity of the project site, this indirect impact would not be significant.
4. The proposed project would not contain or traverse any established BLM Herd Areas (HAs) or Herd Management Areas (HMAs).
5. The proposed project would not disrupt or divide the physical arrangement of an established community.
6. The proposed project may not be consistent with a BLM Interim Policy prohibiting surface disturbing activities on lands donated to BLM or acquired with assistance from the federal Land and Water Conservation Fund. We are uncertain if any such lands remain in the Scenario 5.5 footprint and, if they do, whether BLM will find the project compliant with the Policy.
7. The implementation of renewable projects in Southern California would occur mostly in undeveloped desert lands or areas of rural development, and therefore, would not create physical divisions of established residential communities. Nonetheless, approximately one million acres of land are proposed for solar and wind energy development in the Southern California desert lands. The proposed project would combine with other past and

reasonably foreseeable future projects to substantially reduce scenic values of wilderness areas and recreational resources in the Mojave Desert and southern California desert region and therefore, would result in a significant and unavoidable cumulative land use impact in this regard.

CONCLUSIONS OF LAW

1. The record contains an adequate analysis of the land use laws, ordinances, regulations, and standards that are relevant to the project and establishes that the project will not create any unmitigated, significantly adverse direct land use impacts as defined under the California Environmental Quality Act.
2. The Calico Solar Project would combine with other past and reasonably foreseeable future projects to substantially reduce scenic values of wilderness areas and recreational resources in the Mojave Desert and southern California desert region and therefore, would result in a significant and unavoidable cumulative land use impact in this regard.
3. The project is consistent with all applicable LORS with the possible exception of BLM LM Interim Policy Memorandum (CA 2009 020) regarding lands donated to BLM or acquired with assistance from the federal Land and Water Conservation Fund. As a federal policy, it is not subject to override by the Energy Commission. The BLM, as the author of the policy, is best qualified to interpret and apply it to this project and will do so as part of its decision on the CSP's Right of Way application. Our decision to approve the CSP is therefore contingent upon the grant of the Right of Way application, which we will interpret as a BLM determination that the Policy is satisfied.

No Conditions of Certification are proposed.

Land Use Table 2
Project Compliance with Adopted Land Use LORS

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Federal			
Federal Land Policy and Management Act, 1976 – 43 CFR 1600, Sec. 501. [43 U.S.C. 1761]	(a) The Secretary, with respect to the public lands … are authorized to grant, issue, or renew rights-of-way over, upon, under, or through such lands for: (4) systems for generation, transmission, and distribution of electric energy, except that the applicant shall also comply with all applicable requirements of the Federal Energy Regulatory Commission under the Federal Power Act, including part I thereof (41 Stat. 1063, 16 U.S.C. 791a-825r) [P.L. 102-486, 1992]	YES	The FLPMA authorizes the issuance of a right-of-way grant for electrical generation facilities and transmission lines. In addition, based on staff's review of the Federal Power Act, the requirements would not be applicable to the proposed project as they are not related to renewable resources, and are otherwise related to administrative procedures. Therefore, the proposed project would be in compliance with this policy.
Farmland Protection Policy Act, Section 658.1	As required by section 1541(b) of the [Farmland Protection Policy] Act, 7 U.S.C. 4202(b), Federal agencies are (a) to use the criteria to identify and take into account the adverse effects of their programs on the preservation of farmland, (b) to consider alternative actions, as appropriate, that could lessen adverse effects, and (c) to ensure that their programs, to the extent practicable, are compatible with State and units of local government and private programs and policies to protect farmland.	YES	As discussed above in detail in Section C.8.4.2 (under the subsection entitled "Agricultural Lands and Rangelands"), the farmland conversion impacts of the proposed project would not be adverse. In addition, construction of the proposed project and its onsite linear facilities would be temporary, and the project would not involve other changes in the existing environment that could result in conversion of farmland, to non-agricultural uses. Therefore, proposed project would be consistent with the FPPA.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Bureau of Land Management – California Desert Conservation Area (CDCA) Plan (BLM 1980)	**Chapter 2 – Multiple-Use Classes** **MULTIPLE-USE CLASS GUIDELINES** **MULTIPLE-USE CLASS L (Limited Use)** 6. Electrical Generation Facilities – Electric generation may be allowed. (See wind/solar/ geothermal, below) – Wind/Solar May be allowed after NEPA requirements are met. 7. Transmission Facilities – New gas, electric, and water facilities and cables for interstate communication may be allowed only within designated corridors (see Energy Production and Utility Corridors Element). NEPA requirements will be met. [#5,85]	YES (with BLM's project-specific CDCA Plan Amendment)	The proposed project site is administered by the BLM and is managed under multiple use Class L (Limited Use) categories in conformance with the CDCA Plan (SES 2008a). The proposed project consists of an electrical generating facility, a substation, a transmission line, and ancillary facilities. As such, development of the proposed project is an allowed use under the Multiple-Use Class Guidelines. In addition, the CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission not identified in the Plan be considered through the Plan Amendment process. Therefore, the BLM would undertake a project-specific CDCA Plan amendment along with the ROW grant for the proposed Calico Solar Project. Upon BLM's amendment of the CDCA plan for the Calico Solar Project, the proposed project would be fully compliant with the CDCA Plan. The BLM's Environmental Impact Statement (EIS) acts as the mechanism for meeting NEPA requirements, and also provides the analysis required to support a Plan Amendment identifying the facility within the Plan.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	MULTIPLE-USE CLASS M (Moderate Use) 6. Electrical Generation Facilities All types of electrical generation plants may be allowed in accordance with State, Federal, and local laws. —Wind/Solar May be allowed after NEPA requirements are met. 7. Transmission Facilities — New gas, electric, and water facilities and cables for interstate communication may be allowed only within designated corridors (see Energy Production and Utility Corridors Element). NEPA requirements will be met. [#5,85]	YES (with BLM's project-specific CDCA Plan Amendment)	The proposed project site is on lands administered by the BLM, and is located within the "Moderate" (Class M) use category of the BLM's CDCA Plan, with some areas designated as "Limited" (Class L). These lands are managed under the Multiple-Use Class M and Class L categories in conformance with the CDCA Plan (SES 2008a). The proposed project consists of an electrical generating facility, a substation, a transmission line, and ancillary facilities. As such, development of the proposed project is an allowed use under the Multiple-Use Class Guidelines. In addition, The CDCA Plan, while recognizing the potential compatibility of solar generation facilities on public lands, requires that all sites associated with power generation or transmission not identified in the Plan be considered through the Plan Amendment process. Therefore, the BLM would undertake a project-specific CDCA Plan amendment along with the ROW grant for the proposed Calico Solar Project. Upon BLM's amendment of the CDCA plan for the Calico Solar Project, the proposed project would be fully compliant with the CDCA Plan. The BLM's Environmental Impact Statement (EIS) acts as the mechanism for meeting NEPA requirements, and also provides the analysis required to support a Plan Amendment identifying the facility within the Plan.
	Chapter 3 **Wild Horse and Burros Element** Goal 2. Protect wild horses and burros on public lands by conducting surveillance to prevent unauthorized removal or undue harassment of animals.	YES	As noted in the "Setting and Existing Conditions" subsection above, the proposed project site is not in the vicinity of an HA or HMA; therefore, the project site and surrounding area are not notable for the presence of wild horses or burros. As such, the proposed project would not result in any interference with BLM's management of an HMA, and would be consistent with this

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
			element of the CDCA Plan.
	Chapter 3 **Energy Production and Utility Element** Goal 1. Fully implement the network of joint-use planning corridors to meet projected utility needs to the year 2000. Specific electrical and natural gas right-of-way or power plant site applications made under the provisions of this element should be consistent with adopted California Energy Commission forecasts, which are reviewed biennially. Decision criteria are to: (1) Minimize the number of separate rights-of-way by utilizing existing rights-of-way as a basis for planning corridors; (2) Encourage joint use of corridors for transmission lines, canals, pipelines, and cables; (3) Provide alternative corridors to be considered during processing of applications; (4) Avoid sensitive resources wherever possible; (5) Conform to local plans whenever possible; (6) Consider wilderness values and be consistent with final wilderness recommendations; (7) Complete the delivery-systems network; (8) Consider ongoing projects for which decisions have been made, for example, the Intermountain Power Project; and (9) Consider corridor networks which take into account power needs and alternative fuel resources.	YES	The proposed project's linear facilities would be within the project site, and would interconnect at the SCE Pisgah Substation which is adjacent to the eastern boundary of the project site. Therefore, the proposed project would utilize existing ROWs, and would be consistent with this element of the CDCA Plan.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	Addendum B: Interim Management Guidelines Chapter III. Guidelines for Specific Activities Lands Actions – Disposal, Rights-of-Way, Access and Withdrawals 2. Rights-of-Way: Existing rights-of-way may be renewed if they are still being used for their authorized purpose. New rights-of-way may be approved only for temporary uses that satisfy the non-impairment criteria. 3. Right-of-Way Corridors: Right-of-way corridors may be designated on lands under wilderness review.	YES	The non-impairment standard, directs that "until Congress has determined otherwise" the lands under review be managed so as not to impair their suitability as wilderness (CRS 2004). As the proposed project would not traverse an established Wilderness Area or Wilderness Study Area, the project would be in compliance with this guideline of the CDCA Plan.
Federal Wilderness Act, 16 U.S.C. § 1131-1136	(a) Establishment; Congressional declaration of policy; wilderness areas; administration for public use and enjoyment, protection, preservation… provisions for designation as wilderness areas In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness.	YES	As the proposed project would not traverse an established Wilderness Area, the project would be consistent with this guideline.
Public Rangelands Improvement Act	Establishes and reaffirms the national policy and commitment to inventory and identify current public rangeland conditions and trends; manage, maintain and improve the condition of public rangelands so that they become as productive as feasible for all rangeland values in accordance with management objectives and the land use planning process; and continue the policy of protecting wild free-roaming horses and burros.	YES	As noted in "Setting and Existing Conditions," the project site would be located within the Cady Mountains rangeland allotment. However, according the BLM's Rangeland Specialist from the Barstow Field Office, the land is currently permitted for grazing, and is identified in the West Mojave (WEMO) Plan, for voluntary relinquishment (BLM 2009n). Therefore, the proposed project would not interfere with the Cady Mountains rangeland allotment.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Wild and Free-Roaming Horse and Burro Act	Establishes BLM's authority to protect, manage, and control wild horses and burros to ensure that healthy herds thrive on healthy rangelands. BLM determines the "appropriate management level" (AML) of wild horses and burros on the public rangelands.	YES	As discussed above in detail in Section C.8.4.2, the proposed project would not contain or traverse an established HMA. As such, the proposed project would be consistent with this Act.
LM Interim Policy Memorandum (CA-2009-020)	• Lands acquired by BLM under donation agreements, acquired for mitigation/ compensation purposes and with LWCF funds, are to be managed as avoidance/ exclusion areas for land use authorizations that could result in surface disturbing activities. • Should BLM–California managers have use authorizations applications pending, or receive new applications on lands that meet the above criteria, they are required to notify the State Director and set up a briefing to address how to respond to those applications. • Should managers have inquiries related to pre-application activities for any land use authorizations on lands that meet the above criteria, please notify applicants regarding the location of these lands as soon as possible and advise them to avoid these lands or provide details on how they would plan to operate or mitigate their project in a manner consistent with the values of the lands donated or acquired for conservation purposes.	INCONSISTENT (for the proposed project) CONSISTENT (for Reduced Acreage Alternative)	As noted in the "Setting and Existing Conditions," the proposed project site may still include lands that have been acquired for mitigation/ compensation purposes by LWCF funds. The applicant has not provided the exact acreage of the affected LWCF mitigation lands that currently occur within the revised project site boundary. Nonetheless, based on our review of the BLM's Final Environmental Impact Statement, it appears that some of the lands proposed for Scenario 5.5 may be LWCF lands. In an Interim policy dated May 28, 2009, the State Director of the BLM issued an Instruction Memorandum regarding management of donated land and lands acquired by LWCF funds. As a result, LWCF lands are to be managed as avoidance/exclusion areas for land use authorizations that could result in surface disturbing activities (BLM 2009a). Construction and operation of the proposed project may not be in compliance with this policy, because even with the further revised project boundary, these mitigation lands may still be affected by the proposed project. **We encourage the parties to provide further data and information in their comments on the PMPD. In the interim, we may also receive BLM's decision on the Right of Way permit and, in doing so, must address the project's status under the policy.** However, the Reduced Acreage Alternative, which is smaller in size from Scenario 5.5 by

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
			roughly half is said to avoid LWCF lands, and therefore, would not result in surface disturbing activities in the avoidance/exclusion areas. As such, this alternative would be consistent with this BLM Interim Policy and its requirements.
State			
None			
Local			
San Bernardino County General Plan (CSB 2007a)	**COUNTYWIDE GOALS AND POLICIES OF THE LAND USE ELEMENT** LU 1.2 The design and siting of new development will meet locational and development standards to ensure compatibility of the new development with adjacent land uses and community character. **COUNTYWIDE GOALS AND POLICIES OF THE CONSERVATION ELEMENT** CO 10.2 The location of electric facilities should be consistent with the County's General Plan, and the General Plan should recognize and reflect the need for new and upgraded electric facilities. **DESERT REGION GOALS AND POLICIES OF THE OPEN SPACE ELEMENT** D/OS 1.3 Maintain Rural Living (RL) and Resource Conservation (RC) Land Use Zoning Districts or zoning on steep slopes and remote areas to minimize hillside grading and to protect the rural and natural environment.	YES	In May 2010, the applicant submitted a supplemental report for modifications to the primary water supply, which would require a pipeline that would traverse two private parcels (APNs 052928134 and 052928123) that were previously not within the project boundary. The private parcels are undeveloped land located within the county's Resource Conservation (RC) zoning designation. The county has a "one-map approach" for both the General Plan land use designations and zoning classifications to assure land use consistency between the county's General Plan and its zoning code. As noted in **Land Use Table 1**, the county recently adopted Development Code Chapter 84.29 (Renewable Energy Generating Facilities); therefore, the county recognizes the need for renewable power generating facilities. Refer to the discussion below for the proposed project's consistency with Chapter 84.29. Given the allowances for development of solar power in the RC zone in the county's newly adopted Development Code Chapter 84.29 (Renewable Energy Generating Facilities), the

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
			proposed water pipeline would be consistent with these goals and policies.
	DESERT REGION GOALS AND POLICIES OF THE CONSERVATION ELEMENT GOAL D/CO 2. Encourage utilization of renewable energy resources. **COUNTYWIDE GOALS AND POLICIES OF THE CONSERVATION ELEMENT** CO 8.3 Assist in efforts to develop alternative energy technologies that have minimum adverse effect on the environment, and explore and promote newer opportunities for the use of alternative energy sources.	YES	The proposed water pipeline is a component for the development of a solar energy farm that would produce up to a nominal 500 MW net of power. The power generated by the proposed project would be conveyed into SCE's electric grid to provide electricity supply for the area's population. Because the proposed project makes use of a renewable resource (i.e., sun light), it is consistent with this goal of the General Plan. In addition, the county recently adopted Development Code Chapter 84.29 (Renewable Energy Generating Facilities). Therefore, the county recognizes the need for renewable power generating facilities and has adopted a code to support renewable energy development; and as a component of the proposed project, the water pipeline would be consistent with this goal and policy.

County of San Bernardino 2007 Development Code (CSB 2007b)	**CHAPTER 84.29 RENEWABLE ENERGY GENERATION FACILITIES** **84.29.020 Applicability and Land Use Zoning Districts** The Land Use Zoning Districts that allow renewable energy facilities are limited to the following: RC (Resource Conservation) AG (Agriculture) FW (Floodway) RL (Rural Living) Note: If a facility is proposed solely in the Rural Living land use zoning district, it must include a minimum of 20 acres in the development proposal.IR (Regional Industrial)	YES	This chapter of the county Development Code was recently adopted in February of 2010 in recognition of the State's need for Renewable Power Generating Facilities. The proposed water pipeline is within the RC zone, and as a facility associated with development of solar power is consistent with the county's Development Code.

B. TRAFFIC AND TRANSPORTATION

This section addresses the extent to which the proposed project will affect the local area's transportation network. The evidence includes an analysis of the roadways proposed for construction and operation; potential traffic-related problems associated with the use of these routes; and the anticipated encroachment upon public rights-of-way during the construction of the proposed project and associated facilities.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The project site is located in San Bernardino County on approximately 4,613 acres of land owned by the United States government and managed by the US Department of Interior, Bureau of Land Management (BLM). (Ex. 1, B.1-2.) The Burlington Northern Santa Fe (BSNF) railroad bisects the site from west to east. The key roadways for this project include the following:

- **Interstate-40 (I-40)** – This is an east-west interstate freeway located south of the project site, and which would serve as a major access road to the project. I-40 is a four-lane highway with two lanes in each direction. The existing average daily traffic (ADT) near the vicinity of the Calico Solar Project site is 15,600 vehicles per day; 43 percent is truck traffic. (Ex. 300, p. C.11-6.)
- **National Trails Highway (Route 66)** – This east-west two-lane highway is located approximately 300 feet south of the proposed project site and runs parallel to the I-40. (Ex. 300, p. C.11-6.)
- **Hector Road** – This is the primary access road to the Calico Solar Project site. It is a local road running north-south and begins at Route 66 south of the I-40 and ends south of the BNSF railroad tracks. The existing ADT on Hector Road near the vicinity of the project site is 31 vehicles per day. (Ex. 300, p. C.11-6.)

Three airports were identified in the general project vicinity, but all of these airports were over 18 miles away from the project site. (Ex. 300, p. C.11-8.)

The BNSF provides long-haul freight service throughout the United States. Near and on the project site, BNSF operates a double-track railroad line through the project site from east to west. AMTRAK's Southwest Chief route from Los Angeles to Chicago travels on this rail line through the site. The BNSF rail lines are heavily used by freight trains. The trains, some of which are approximately 10,000 feet long, cross the tracks approximately every fifteen minutes from both directions.. (Ex. 300, pp. C.11-7 and C.11-9.)

The Levels of Service (LOS)[1] for street intersections in the project vicinity are shown below in **Traffic and Transportation Table 1**:

Traffic and Transportation Table 1
2011 Peak Hour Roadway Traffic Volumes
Design Capacities, and Levels of Service Without Project

2011 Existing Conditions without Calico			**Morning Peak Hour**		**Evening Peak Hour**	
Roadway Segment	**Traffic Volumes**	**LOS**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**	**LOS**
I-40 – West of Hector Road	15,660[1]	B[4]	8.8	A	8.8	A
I-40 – East of Hector Road	16,850[1]	B[4]	8.8	A	8.8	A
Hector Road – North of I-40	10/10[2]	A/A[5]	---	---	8.5	---
Hector Road – South of I-40	10/15[5]	A/A[5]	---		---	---
National Trails Highway – West of Hector Road	10/10[2]	A/A[5]	8.5	A	8.5	A
National Trails Highway – East of Hector Road	10/15[2]	A/A[5]	8.5	A	8.5	A
BLM Access Road – North of I-40	N/A	N/A	---	---	---	---

Notes and Sources: 2007 Traffic Volumes (Caltrans, 2008a); [2]AM/PM Volumes (Higher Volumes between Northbound and Southbound Direction), Source: National Data Services, 2008a; 2007 Truck Volumes (Caltrans, 2008b); 4 ADT LOS; 5 Peak Hour LOS; 6 Peak Hour LOS is based on **Table 5.11-3**, San Bernardino CMP, 2003 Update. Information not listed was not available; ADT = Average Daily Traffic; LOS = Level of Service. Source: URS Corporation; Ex. 300, C.11-14, **Table 1**.

1. Construction Traffic

The Applicant anticipates that construction will take approximately 44 months beginning in 2010 and ending in 2014. The construction work force will peak during month 16 at approximately 731 workers per day in month seven (2011) and average approximately 400 workers over the course of construction. The construction workforce will be drawn from San Bernardino and Riverside counties. Approximately 20 percent of the workers are expected to travel east on I-40; approximately 80 percent, west on I-40. (Ex. 300, pp. C.11-11 to C.11-12.)

To evaluate the worst-case scenario, the traffic analysis assumed no workers would carpool and all workers would arrive during the morning peak period (7 AM

[1] The operating conditions of a roadway (surface street) system, including intersections, are described using the term "level of service." Level of service (LOS) is a description of a driver's experience at an intersection or roadway based on the level of congestion (delay). LOS can range from "A," representing free-flow conditions with little or no delay to "F," representing saturated conditions with substantial delay.

to 9 AM) and depart during the evening peak period (4 PM to 6 PM). During peak construction, the daily round trips for workers would total 1,462 trips, 731 inbound in morning and 731 outbound in evening. (Ex. 300, p. C.11-11.)

Parking for workers will be provided in the 14-acre construction laydown area adjacent to the main services complex as well as the 26-acre laydown and staging areas south of the complex. Employees may travel to and from the site and/or the laydown parking areas in shuttles or other similar vehicles. We adopt Condition of Certification **TRANS-2** that requires the Applicant to develop a parking and staging plan for workforce and construction vehicles. This plan will include any impediments that may occur because of the need to cross the BNSF Railway tracks.. (Ex. 300, p. C.11-11.)

According to the Applicant, for the first ten months of construction temporary access for construction will be provided from an existing road off I-40, which will be designed to cross the railroad tracks. In October 2011, construction traffic will use a permanent access road designed to use the same exit off of Hector Road and, which will be designed with a new bridge over the BNSF railroad tracks. We adopt Condition of Certification **TRANS-1** that requires the Applicant to obtain an easement from BNSF Railway to construct the road on its right-of-way before construction begins. This Condition also requires the Applicant to construct an all-weather road so emergency vehicles have access to the site. (Ex. 300, p. C.11-6.)

The existing BSNF line could pose a safety hazard for construction workers and others visiting or making deliveries to the project site. The frequency of the trains (every fifteen minutes) could result in traffic backing up or stacking on I-40 as workers wait in vehicles for the train to pass and to cross the tracks. The same scenario could occur as workers leave the site. State and federal regulations require that a flag person be present at all times wherever workers, delivery persons, or visitors cross an unattended or open track. To address this issue, we adopt Condition of Certification **TRANS-2** to require implementation of measures that reduce traffic on I-40 during critical commute times and ensure safe crossing of the BSNF Railway tracks. This Condition requires a traffic control plan that will also address access by emergency service vehicles. (Ex. 300, p. C.11-10.)

During construction, most deliveries will occur between 7 AM and 5 PM on weekdays. Because delivery trucks will use the temporary intersection off I-40 to Hector Road controlled by a stop sign, we adopt Condition of Certification

TRANS-2 so that arrival and departure time of these trucks does not occur in peak traffic periods. (Ex. 300, p. C.11-15.)

To transport this equipment, the Applicant must obtain special permits from Caltrans to move oversized or overweight materials and address other issues such as routes used and delivery times. We adopt Condition of Certification **TRANS-3** to ensure the project owner complies with vehicle size and weight limitation requirements of Caltrans and other relevant jurisdictions; Condition of Certification **TRANS-4** to ensure the Applicant complies with Caltrans' and other relevant jurisdictions' limitations on encroachments into public rights of way; and **TRANS-5** to ensure that the project owner will restore all public roads, easements, and rights-of-way that have been damaged due to project-related construction activities. (Ex. 300, pp. C.11-15.to C.11-16.)

The evidence shows that vicinity roadways would continue to operate at LOS C or better during the morning and evening peak hours. **Table 2** below shows that construction would not cause any of the Levels of Service to deteriorate to a level that would have a significant impact. (Ex. 300, pp. C.11-14 and C.11-**15, Tables 4** and **6**.)

Traffic and Transportation Table 2
2011 Peak Hour Roadway Traffic Volumes
Design Capacities, and Levels of Service With Project

2011 Existing Conditions with Calico			**Morning Peak Hour**		**Evening Peak Hour**	
Roadway Segment	**Traffic Volumes**	**LOS**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh**	**LOS**
I-40 – West of Hector Road	17,000[1]	B[4]	15.5	C	13.1	B
I-40 – East of Hector Road	17,250[1]	B[4]	16.5	C	11.0	B
Hector Road – North of I-40	705/775[2]	B/C[5]	---	---	---	---
Hector Road – South of I-40	10/15[2]	A/A[5]	---	---	---	---
National Trails Highway – West of Hector Road	10/10[2]	A/A[5]	8.5	A	8.5	A
National Trails Highway – East of Hector Road	10/15[2]	A/A[5]	8.5	A	8.5	A
BLM Access Road – North of I-40	81/12[2]	A/A[5]	---	---	---	---

Notes and Sources: 2007 Traffic Volumes (Caltrans, 2008a); [2]AM/PM Volumes (Higher Volumes between Northbound and Southbound Direction), Source: National Data Services, 2008a; 2007 Truck Volumes (Caltrans, 2008b); 4 ADT LOS; 5 Peak Hour LOS; 6 Peak Hour LOS is based on Table 5.11-3, San Bernardino CMP, 2003 Update. Information not listed was not available; ADT = Average Daily Traffic; LOS = Level of Service. Source: URS Corporation 2008; Ex. 300, p. C.11-14.

2. Construction Phase Transport of Hazardous Materials and Waste

Approximately ten types of hazardous materials, including hydrogen gas, will be used at the site during construction. These materials will be transported to the site and removed from the site by trucks via I-40. We adopt Conditions of Certification **TRANS-2** that requires the traffic control plan to address the transport of hazardous materials and **TRANS-6** to ensure that the transporting of hazardous materials will comply with all applicable federal and state regulations. (Ex. 300, p. C.11-16.) The handling and disposal of hazardous substances is also addressed in the **Hazardous Materials Handling** discussion in this Decision.

3. Operation Impacts and Mitigation

Operation of the Calico Solar Project will result in a small amount of vehicular traffic. Operational workforce is estimated to be 164 workers. The arrival and departure time of those workers will be staggered in three 8-hour shifts over operations on a 24 hour, 7-day-a-week basis. Consequently, peak week-day traffic will be 53 vehicles even if every employee were to commute in his or her own vehicle. The surrounding roadways and intersections are projected to operate well below LOS capacity when the project is operational in 2016. (Ex. 300, p. C.11-17.)

The Applicant will build a permanent access road to the site directly from I-40. To ensure adequate access for emergency vehicles, we adopt Condition of Certification **TRANS-1** to ensure that the access road conforms with local, county, and State Fire Marshal Codes. (Ex. 300, p. C.11-17.)

Parking for workers would be provided on a 10-acre satellite services complex located in the eastern portion of the project site. When operational, the project would employ up to 164 workers, who would work in three 8-hour shifts. We adopt Condition of Certification **TRANS-2** that requires a traffic control plan to ensure adequate parking for workers. (Ex. 300, p. C.11-18.)

As noted earlier, the BNSF operates a double-track railroad line through the project site. The project includes construction of a bridge over the tracks that will be used for permanent access at the project site. Therefore, we find that no mitigation is necessary to address crossing of the tracks during operation. (Ex. 300, p. C.11-17.)

Similar to the discussion in construction, the project will use hazardous materials during operation. These materials will be delivered to and removed from the site by truck via the I-40. To address the transport of hazardous materials, we adopt Condition of Certification **TRANS-6** that will require compliance with all applicable federal and state regulations. (Ex. 300, p. C.11-16.)

The proposed Calico Solar Project will use SunCatchers— a 40-foot tall, 25 kilowatt-electrical (kWe) solar dish developed by Stirling Energy Systems. The SunCatcher system consists of a unique radial solar concentrator dish structure that supports an array of curved glass mirror facets. These mirrors are designed to automatically track the sun and collect and focus or concentrate its solar energy onto a patented power conversion unit (PCU).

The SunCatcher mirrors have the potential to pose a visual hazard (glare). The SunCatcher mirrors have the potential to move off-axis during cloud cover, and the reflection of the sun on the mirrors nearest the rail line or roadways may pose a hazard (temporary flash blindness) to motorists on Hector Road, I-40, and Route 66; and to train crews using the BNSF tracks. To address the potential for flash blindness, we adopt Condition of Certification **TRANS-7,** which requires the project owner to modify the normal and offset tracking position to specific specifications and ensures specific morning-stow and night-stow procedures are followed. This Condition also requires a 223-foot minimum distance from any SunCatcher reflector assembly to the BNSF ROW or any public roadway to reduce the possibility of temporary flash blindness. The project owner must also prepare an emergency glare response program that includes a monitoring plan; plan for reporting malfunctions and complaints; immediate repositioning of malfunctioning units; and a process of evaluating intrusive light conditions through video surveillance. (Ex. 300, p. C.11-19.)

BNSF Railway has communicated its concern about the effect of glint and glare on the railroad engineers' ability to clearly and accurately see signal lights. Staff has taken these comments into consideration. Because of the significance of the signal lights to the operational safety of the crews and trains, Staff has determined that any escaping glint and glare that may affect the railroad engineer's ability to clearly and accurately see signal lights will require shielding. Therefore, we adopt Condition of Certification **TRANS-7**, which requires the Applicant to work with the BNSF Railway to determine the appropriate size and design of shields to be affixed to signal lights as well as measures to increase the contrast of the signal light, including orienting the shield around the signal light;

ensuring the darkest background possible on the signal light; or use of current LED signal technology. (Ex. 300, p. C.11-19.)

The evidence shows that vicinity roadways will continue to operate at LOS C or better during the morning and evening peak hours. Operation will not cause any of these Levels of Service to deteriorate to a level that will have a significant adverse impact. In addition, the evidence shows that the Calico Solar Project has the potential to cause glint and glare in the project area. However, with the implementation of Condition of Certification **TRANS-7** the project will not have a significant adverse impact to motorists or to the BNSF Railway.

4. Cumulative impacts

A significant cumulative impact may be created as a result of the combination of the proposed project together with other projects causing impacts. The evidence shows that seven projects were identified in the general vicinity of the Calico Solar Project. The traffic-related impacts of these existing or proposed projects when combined with the traffic-related activities of the Calico Solar Project were considered in the cumulative impact evaluation. (Ex. 300, p. C.11-25.)
Eleven projects either exist or are projected to be constructed during the same time frame as the Calico Solar Project. There is no evidence in the record that the construction or operation of these other projects will result in cumulative impact to traffic flow during the construction or operation of the Calico Solar Project. We find that the Calico Solar Project will not contribute to cumulative impacts for the following reasons: (Ex. 300, pp. C.11-27 and C.11-28.)

- The number of workers needed for existing projects is minimal.
- The Calico Solar Project mitigation measures will result in acceptable levels of service on roads and highways.
- Even if all existing and proposed projects used the same roadways, which is not the case, the locations of the various projects, different start times, and direction of travel used by workers; and Conditions of Certifications imposed on the projects, including the Calico Solar Project, to keep traffic at acceptable LOS level, will help to ensure that affected roadways operate at acceptable levels.

Truck travel as well as other non-employee site visits will be very small and will typically occur during non-peak periods. Consequently, cumulative operational impacts will not be significant and will not require mitigation. (Ex. 300, p. C.11-27

5. Public and Agency Comments

Comments were received from the Applicant and from the BSNF Railway regarding the project. These comments are summarized below.

The Applicant contends that there is no potential for cumulative traffic impacts between the Calico Solar Project and the Abengoa Mojave Project because employee travel patterns will not overlap. The Calico Solar workforce is expected to originate almost entirely in Barstow and in the opposite direction of the Abengoa project. As such, the Applicant requested that Staff delete Condition of Certification **TRANS-2**. Staff considered the Applicant's comments, reviewed the documents filed, and modified Condition of Certification **TRANS-2** to address Applicant concerns. The revised Condition now provides the Applicant flexibility in determining its options for controlling traffic. (Ex. 300, p. C.11-31.)

On July 29, 2010, BSNF Railway submitted a comment letter that identified concerns with glint and glare and requested intervener status on the project. BNSF Railway also presented this letter/request at the Commission's Prehearing Conference on July 30, 2010. BNSF requested a site-specific glint and glare study prior to the first SunCatcher disc being mounted on a pedestal. (Ex. 300, p. C.11-31.)

Staff worked with BNSF representatives to resolve their concerns with glint and glare. A glint and glare study was prepared for the project, which was reviewed with BNSF Railway representatives. BNSF representatives also expressed concern with the effect of glare on the railroad engineer's ability to correctly perceive the color of the signal lights. Staff identified Condition of Certification **TRANS-7** to require the Applicant to work with BNSF Railway to fund and conduct a study to determine the specific measures needed, if any, to ensure that the correct signal color is visible to BNSF Railway engineers. Staff determined that measures such as hooding or increasing the intensity of the lights will ensure that BNSF Railway engineers can correctly perceive the color of the signal. This study and modifications to the signal, if required, are to be completed before operation of the Calico Solar Project. (Ex. 300, p. C.11-32.)

FINDINGS OF FACT

Based on the evidence, we find and conclude as follows:

1. The additional traffic associated with construction and operation of the Calico Solar Project will not have an adverse effect on existing levels of service for roads in the project vicinity with the implementation of Conditions of Certification **TRANS-1** to **TRANS-5**.

2. Development and implementation of a construction traffic control program will offset any temporary, short-term increases in congestion resulting from construction of the project.

3. The Suncatcher mirrors have the potential to produce glint and glare near public roads and the BNSF railroad right-of-way. Condition of Certification **TRANS-7** will reduce these impacts.

4. Potential adverse impacts associated with the transportation of hazardous materials during construction and operation of the project will be mitigated to insignificance by compliance with applicable federal and state laws and Condition of Certification **TRANS-6**.

5. The traffic associated with cumulative projects will not impact regional and local roadways with the implementation of the Conditions of Certification.

6. Implementation of the Conditions of Certification, below, ensure that both construction and operation of the project will comply with all applicable laws, ordinances, regulations, and standards regarding traffic and transportation as identified in the pertinent portion of **Appendix A** of this Decision.

CONCLUSION OF LAW

1. The Commission, therefore, concludes that construction and operation of the project, as mitigated herein, will not result in any significant, direct, indirect, or cumulative adverse impacts to the local or regional traffic and transportation system and will comply with all applicable LORS.

CONDITIONS OF CERTIFICATION

TRANS-1– Construction of All-Weather Roads and Bridge. If an easement is granted and the Applicant begins construction, the Applicant shall construct an all-weather road according to (1) California State Fire Marshall specifications as outlined in California Fire Code Section

902.2.1 et seq. These roads shall be constructed with appropriate materials, including culverts and paving, so that they will be safe for use in crossing washes at the site.

In addition, the Applicant shall coordinate its activities with the BNSF Railway. Those activities include working with the Public Utilities Commission to ensure compliance with provisions of the California Public Utilities Code Sections 1201- 1220.

During construction of both the temporary and permanent road, temporary crossing of BNSF tracks, and permanent crossing of BNSF tracks, the Applicant shall prepare and coordinate with BNSF Railway; California Public Utilities Commission; and Federal Railroad Administration a safety plan for ensuring that all state and federal safety requirements for railroad crossings are followed.

That plan shall be reviewed and coordinated with BNSF Railway, appropriate regulatory agencies, and the CPM to ensure compliance with all state and federal requirements and approved by those agencies s well as the CPM.

Verification: At least 30-days prior to the start of mobilization, right-of-way easements shall be obtained and presented to the CPM. In addition to the BSNF easement, the project owner shall provide the CPM a copy of all documents pertaining to approvals from the Federal Railroad Administration (FRA); and the California Public Utilities Commission (CPUC). A courtesy copy shall be provided to the California Department of Transportation (Caltrans), District 8 Office. Within 30 days after the completion of each road and railroad crossing improvements, the project owner shall provide the CPM with a copy of written approvals from BNSF, FRA, and CPUC as to the adequacy and safety of the roads and bridge.

TRANS-2 – **Traffic Control Plan.** Prior to the start of construction for the Calico Solar Project, the project owner shall prepare and implement a traffic control plan (TPC) for the project's construction and operation traffic. The plan shall address the movement of workers, vehicles, and materials, including arrival and departure schedules and designated workforce and delivery routes.

For the project's construction period, the plan is to be designed to take into account any impediments that may or could occur because of the need to cross BNSF Railway tracks. In developing this plan the Applicant is required to consider off-site parking and staging in designated areas and the use of buses to transport workers to and from the construction site.

Once the bridge is constructed, the Applicant shall prepare a parking and staging plan to require all project-related parking to occur on-site or in designated off-site parking areas and that staging occurs on-site in a specifically-defined area.

The project owner shall consult with the BNSF Railway; County of San Bernardino; and the California Department of Transportation (Caltrans) District 8 office in the preparation and implementation of the plan and shall submit the proposed traffic control plan to the BNSF Railway; County of San Bernardino; and Department of Transportation (Caltrans) District 8 office in sufficient time for review and comment. The plan, along with any written comments from the BNSF Railway, County of San Bernardino; and Department of Transportation (Caltrans) District 8 office, shall then be submitted to the Energy Commission Compliance Program Manager (CPM) for review and approval prior to the proposed start of construction and implementation of the plan.

The traffic control plan shall include:

- A work schedule and end-of-shift departure plan designed to ensure that stacking does not occur on intersections necessary to enter and exit the project site. The project owner shall consider using one or more of the following measures designed to prevent stacking: (1) staggered work shifts; (2) off-peak work schedules; and (3) restricting travel to and departures from the project site to ten or fewer vehicles every three minutes during peak travel hours on Interstate 40.

- Provisions for at least two flaggers stationed at the BNSF Railway crossing during each day of construction until the proposed bridge is constructed and operating. Flaggers shall be present at the BNSF Railway crossing to ensure the safe crossing of workers, visitors, and delivery persons arriving and leaving the project site.
- Provisions for an incentive program such as an employer-sponsored Commuter Check Program to encourage construction workers to carpool or use van or bus service or both.
- Provisions for delivering and staging of heavy equipment and building material deliveries as well as for the movement of hazardous materials to the site.
- Limitation on truck deliveries to the project sites to only off-peak hours to ensure adequate exit and entry at appropriate intersections and railroad tracks.
- On I-40, provisions for direction and redirection of construction traffic with flag persons as necessary to ensure traffic safety and minimize interruptions to non-construction-related traffic flow.
- Placement of signage, lighting, and traffic control devices at the project construction site and laydown areas.

- Signage along eastbound and westbound appropriate roads and at the entrance of the Hector Road I-40 northbound and southbound off-ramps to notifying drivers of construction traffic throughout the duration of the construction period.
- A heavy-haul plan designed to address the transport and delivery of heavy and oversized loads requiring permits from Department of Transportation (Caltrans) or other state and federal agencies.
- Parking for workforce and construction vehicles, including consideration of off-site parking prior to opening of bridge across BNSF Railway tracks, to prevent stacking on I-40 roads and intersections and facilitate timely and safer crossing across tracks for workers, visitors, and delivery persons as well as for emergency access.

Verification: At least 30-days prior to the start of construction, including any grading or site remediation on the power plant site or its associated easements, the project owner shall submit the proposed traffic control plan to BNSF Railway; San Bernardino County; and the Department of Transportation (Caltrans) District 8 office for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to BNSF Railway; San Bernardino County; and the Department of Transportation (Caltrans) District 8 office requesting review and comment.

At least 60 calendar days prior to the start of construction, the project owner shall provide copies of any comment letters received from BNSF Railway; San Bernardino County; and the Department of Transportation (Caltrans) District 8 office along with any changes to the proposed traffic control plan for CPM review and approval.

TRANS-3 – Limitations on Vehicle Size and Weight. Due to the dynamic nature of the construction environment, at least 30 days prior to the start of construction, the project owner shall consult with the BNSF Railway, San Bernardino County, and the Caltrans District 8 office to coordinate procedures for obtaining required and necessary easement and permits on an as-needed basis.

After consultation with BNSF Railway, San Bernardino County, and the Caltrans Office District 8 office, the project owner shall prepare a coordination plan designed to comply with limitations imposed by California Department of Transportation (Caltrans) District 8 office and other relevant jurisdictions including San Bernardino County on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for use of roadways.

Verification: At least 30 calendar days prior to construction, a copy of the coordination plan shall be provided to the CPM for review and comment. In addition, the project owner shall provide copies of easements and permits

obtained from BNSF Railway; San Bernardino County; and the Caltrans District 8 office to the CPM.

In the Monthly Compliance Reports (MCRs), the project owner shall submit copies of any easements or permits or both received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation. The project owner shall retain copies of BNSF Railway easements for the life of the project.

TRANS-4 – Encroachment into Public Rights of Way. The project owner and its contractor shall comply with Caltrans and other relevant jurisdictions limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: In the monthly compliance reports (MCRs), the project owner shall submit copies of permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS 5 – Restoration of All Public Roads, Easements, and Rights-of-Way. The project owner shall restore all public roads, easements, and rights-of-way that have been damaged due to project-related construction activities to original or near-original condition in a timely manner, as directed by the CPM. Repairs and restoration of access roads may be required at any time during the construction phase of the project to assure safe ingress and egress.

Verification: At least 30 days prior to the start of mobilization, the project owner shall photograph or videotape all affected public roads, easements, and right-of-way segments and/or intersections and shall provide the CPM, the affected local jurisdictions, and Caltrans (if applicable) with a copy of these images. The project owner shall rebuild, repair and maintain all public roads, easements, rights-of-way in a usable condition throughout the construction phase of the project.

In addition, the project owner shall consult with the County of San Bernardino and California Department of Transportation (Caltrans) District 8 and notify them of the proposed schedule for project construction. The purpose of this notification is to request that San Bernardino County and Caltrans consider postponement of public right-of-way repair or improvement activities in areas affected by project construction until construction is completed and to coordinate with the project owner regarding any concurrent construction-related activities that are planned or in progress and cannot be postponed. The purpose of this requirement is to help ensure cooperation from San Bernardino County and Caltrans so that the Applicant's construction work is accommodated and the project can be completed in a timely and safe manner.

TRANS 6 – Permits/Licenses to Transport Hazardous Materials. The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

Verification: The project owner shall include in its monthly compliance reports (MCRs), copies of all permits and licenses acquired by the project owner or contractors or both concerning the transport of hazardous substances.

TRANS-7 – Prevention of Glare from SunCatchers to BNSF Train Crews and Motorists on Hector Road; Route 66; and Interstate 40

This Condition of Certification is divided into two sections. Section One concerns the testing of signals to ensure that they are easily visible to train engineers. Section Two concerns general location, operating, and reporting procedures pertaining to the SunCatcher mirrors.

I. Signal Light Modifications

Immediately after the installation of the first SunCatcher mirrors near the BNSF Railway right-of-way but before operation of the mirrors, the Applicant will work with BNSF Railway to ensure that the operation of the SunCatcher mirrors will not interfere with the railroad engineers' ability to accurately see and respond to appropriate signal lights.

The Applicant will work with BNSF Railway to determine the appropriate size and design of shields to be affixed to signal lights as well as measures to increase the contrast of the signal light, including orienting the appropriately sized shield around the signal light and increasing the brightness of the signal light emitter over historic light levels using current LED signal technology.

In addition, the Applicant will work with BNSF Railway to determine emergency reporting procedures to immediately identify, report, and repair any malfunctioning or missing shield.

Verification: Signal Light Modifications. At least 45 days before the first SunCatchers are operated, the Applicant shall consult with BNSF to prepare a plan to design, develop, and manufacture the appropriate shields to ensure that railroad engineers can accurately identify and respond properly to signal lights. As part of the development process, the Applicant shall coordinate the development of the plan as well as the manufacture and installation of these shields with BNSF Railway, California Public Utilities Commission, and the CPM. The completed plan shall be submitted to the CPM for review and approval at least 30 days prior to the start of operations.

At least 30 days before the first SunCatchers are operated, the Applicant shall consult with BNSF Railway to test the shielded signal lights to ensure that the railroad engineers can accurately identify and respond to the appropriate signal. The CPM shall also be notified when testing shall occur.

Once BNSF Railway, California Public Utilities Commission has accepted the modified shield and verified that it allows the railroad engineers to accurately identify and respond to the proper signal, the Applicant, along with BNSF Railway, shall coordinate methods and reporting procedures to ensure their safe and effective use.

The Applicant shall develop, with BNSF Railway's input and approval, a monitoring plan that shall provide for the immediate reporting of any defective shield as well as its immediate replacement. This plan shall include methods for coordinating and implementing these reporting procedures with all necessary federal, state, and local agencies as well as BNSF Railway. This monitoring plan shall be submitted to the CPM for review and approval.

In addition, the project owner shall provide the CPM a monthly report that includes the date, time, location, response, and response time of any malfunction, public complaint, or video detection covered by the emergency glare response program; any determinations made by the project owner as to cause of the problem; and methods taken to resolve the problem. A copy of these reports shall be kept by the project owner for at least five years.

II. General Location, Operating, and Reporting Procedures

The project owner shall accomplish the following:

1. Modify the offset tracking procedure to use a 25-degree offset instead of the proposed 10-degree offset.

2. Ensure the morning stow position-to-offset position transitions occur at least 30 minutes before sunrise and end in the 25 percent offset tracking position.

3. Ensure that the "Night Stow" should occur 30 minutes after sunset to avoid any intrusive light effects.

4. Ensure that the minimum distance from any SunCatcher reflector assembly to the BNSF right-of-way (ROW) or any public roadway shall be a minimum of 223 feet to reduce the possibility of temporary flash blindness. In addition, during the normal tracking and offset tracking positions, the project operator shall adhere to the following procedures and specifications:

5. Develop and implement an emergency glare response program that includes all of the following:

    a. Monitoring plan that requires (1) the use of video surveillance trucks to identify and document intrusive light conditions, covering all hours of operation on a weekly basis for five years; and (2) monitoring of the status of individual SunCatchers during all hours of operation to immediately

identify any malfunctioning units with the potential to create glare within the BNSF Railway right-of-way; or on I-40, Route 66, or Hector Road.

b. Procedures that allow motorists and train operators, including AMTRAK and BNSF, to report to the project owner, as well as to Caltrans, California Highway Patrol (CHP), and the County of San Bernardino. In the case of complaints from motorists, any problems with glint or glare resulting from the operation or malfunction of SunCatchers. The procedures developed by the Applicant for public reporting of glare problems shall be developed in consultation with BNSF Railway, California Department of Transportation (Caltrans) District 8 office, California Highway Patrol (CHP), and San Bernardino County. These procedures shall include a toll-free number for reporting problems as well as a process for written notification to the project owner and to California Department of Transportation (Caltrans, District 8) and San Bernardino County, in the case of complaints from motorists; or to AMTRAK or BNSF Railway, or both, in the case of complaints from train operators or passengers.

c. Procedures for the immediate (1) repositioning of any malfunctioning units to avoid potential glare within the BNSF Railway right-of-way or on I-40, Route 66, or Hector Road; investigation and resolution of complaints received from train operators or motorists or both.

d. Process for evaluating intrusive light conditions identified by the video surveillance and determining, in consultation with the CPM, what operational or other changes may be warranted to reduce or eliminate the identified intrusion.

e. Procedures for documenting instances when malfunctioning units with the potential to create glare are identified, or when train operators or motorists complain of glare, and the actions taken in response to those instances or complaints.

f. Period reports to the Project CPM detailing instances of SunCatcher malfunction, public complaints about glare, or video-detected problems that are covered by the emergency glare response program.

Verification: General Location, Operating, and Reporting. At least 30 days before the first SunCatchers are tested or operated, the project owner shall submit documentation to the CPM necessary to verify that the operational measures and setback requirements included in this Condition of Certification will be implemented and achieved.

At least 15 days before the SunCatchers are tested or operated, the project owner shall .submit to the CPM, for the CPM's review and approval, a copy of the project owner's draft emergency glare response program, including methods for coordinating and implementing the program with all state, county, and local agencies as well as BNFS Railway and AMTRAK.

Beginning no more than 30 days after the first SunCatchers are tested or operated and continuing for the duration of project operations, the project owner shall develop a procedure for any motorist, passenger, worker, train personnel, or visitor to report a malfunctioning unit and make those procedures known and available to those groups. The project owner shall provide the CPM a monthly report that includes the date, time, location, response, and response time of any malfunction, public complaint, or video detection covered by the emergency glare response program; any determinations made by the project owner as to cause of the problem; and methods taken to resolve the problem. A copy of these reports shall be kept by the project owner for at least five years.

C. SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

The socioeconomic and environmental justice analysis reviewed the demographic characteristics of the project site to evaluate the potential impacts of project-induced population increases and the fiscal and physical capacities of local communities to accommodate population increases. The project's economic benefits, including local project-related expenditures, property and sales tax revenues, as well as school impact fees, are also discussed. Additionally, an environmental justice screening analysis is included to determine whether the project will result in disproportionate impacts on minority and/or low-income populations and, if so, whether mitigation is required.

The evidence for this topic was uncontested. (Ex. 300, p. C.10-1 et seq.)

SUMMARY AND DISCUSSION OF THE EVIDENCE

Under the CEQA Guidelines, a project may have a significant effect on socioeconomics if it would:

- Induce substantial population growth in an area, either directly or indirectly;
- Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere; or
- Adversely impact acceptable levels of service for fire and police protection, schools, parks and recreation, and other public facilities. (Ex. 300, p. C.10-2.)

The Applicant will construct the Calico Solar Project in two phases over an approximate 44-month period. The project site will be located on undeveloped land in San Bernardino County, primarily on BLM-administered land. The proposed project site is approximately 37 miles east of the City of Barstow. This assessment used San Bernardino County and Riverside County labor markets to evaluate construction worker availability. To determine if a project would have any significant impacts, Staff analyzed whether community services and capacities could absorb the project- related impacts. The project's property taxes, sales tax, local school impact fees, or development fees can help local governments augment public services. If the project's impacts could appreciably strain or degrade these services, then the impact would be significant adverse. (Exs. 1, p. 5.10-2; 300, p. C.10-2 and C.10-4.)

1. Potential Impacts

An increased demand for labor could result in an influx of non-local workers and their dependents, resulting in a strain on housing, schools, parks and recreation, law enforcement, and medical services. (Ex. 300, p. C.10-2 to C.10-3.)

During the 41-month construction period for the Calico Solar Project, the project owner will employ an average of 400 construction workers a month, with a peak of 700 workers in the seventh month. The types of construction workers sought by the project will include laborers, craftspeople, technicians, supervisory, support, and management personnel. The construction trades include occupations that will assemble the proposed SunCatcher units; workers engaged in these occupations will require on-site training. (Exs. 1, p. 5.10.16; 300, p. C.10-7.)

The evidentiary record indicates that the total labor by skill in the Riverside-San Bernardino-Ontario and Los Angeles County Metropolitan Statistical Areas (MSA) is more than adequate to provide construction labor for the Calico Solar Project. Because the majority of the construction workforce resides within San Bernardino and Riverside Counties, we find that construction of the project will not adversely induce substantial population growth. (Ex. 300, pp. C.10-6 to C.10-7.)

The record indicates that power plant construction workers will typically commute up to two hours from their homes to a project site rather than permanently relocating to the site. (Exs. 1. p. 5.10-16; 300. p. C.10-2.) Because of the large labor force within commuting distance of the project, the majority of construction and operations workers will commute to the project daily from their existing residences. Some workers may stay in local motels or other rental properties during the workweek but return to their homes on weekends for the duration of their job assignments. The evidence shows that an adequate supply of motels and rental properties is available in the City of Barstow, and San Bernardino and Riverside Counties to accommodate weekly commuters and/or temporary residents. (Exs. 1, p. 5.10.22; 300, p. C.10-8.)

The project would have 180 full-time employees; the majority of whom are expected to already reside in the area or within a one hour commute of the project site. The Applicant expects to recruit 20 operational jobs from outside the immediate project area. Some workers may relocate with their families to the

Barstow area with no expected adverse impacts on the local infrastructure or community services. (Exs. 1, § 5.10.2.2; 300, p. C.10-8.)

The Calico Solar Project will be located primarily on BLM-administered land in a relatively remote and largely uninhabited area. Therefore, we find that construction and operation of the project will not adversely impact existing housing supply or require new housing construction. (Exs. 1, § 5.10.2.2: 300, p. C.10-8 to C.10-9.)

Since project-induced population changes will be minimal, construction and operation of the project will not result in significant adverse impacts on schools, parks and recreation, law enforcement, hospitals, or emergency services in the local communities. (Exs. 1, §§ 5.10.2.2 and 5.10.2.3; 300, pp. C.10-9 to C.-10-12.) See further discussion in the **Worker Safety and Fire Protection** section of this Decision regarding fire safety services..

The Calico Solar Project site is located within the Sliver Valley Unified School District. The Barstow Unified School District is also located within the vicinity of the project site. Section 17620 of the California Education Code allows school districts to levy school development fees for new commercial or industrial construction within school district boundaries. (See also Govt. Code, §§ 65996-65997.) These fees are based on the project's square feet of habitable space. Because the main services complex of the Calico Solar Project (considered "habitable space") will be constructed entirely on BLM land, no private land would be affected and therefore, the provisions of Education Code Section 17620 would not apply to this project. In addition, the Silver Valley Unified School District indicated that the proposed project will be exempt from the school impact fees because it would be developed on federal lands. (Ex. 1. p. 5.10 13; Ex. 300, p. C.10-12.)

2. Section 25523(h) Public Benefit Findings

Public Resources Code section 25523(h) requires discussion of the project's economic benefits. The project's fiscal benefits, based on property value, payroll, local purchases of equipment, supplies, and associated expenses, include the following estimates:

Property Taxes. Under existing state law, the Calico Solar Project is exempt from property taxes as a qualifying solar energy project.[1] If the property tax exemption should lapse, the estimated tax would be $220,000 based on the local tax rate of 1.1 percent applied to the solar project components (storage, power conditioning equipment, transfer equipment, and parts relating to functioning of these items). (Ex. 1, p 5.10-30.)

Capital Costs and Payroll. The total capital cost of the Calico Solar Project is estimated at $1 billion for the final build-out of both phases of development. The total construction payroll over 44 months is estimated at $159 million. The construction payroll, local purchases of materials and supplies, and sales tax revenues generated by the expenditures will have a temporary beneficial impact on the San Bernardino County economy. (Exs. 1, p 5.10-24; 300. P. C.10-19.)

The annual operations and management (O&M) budget for the project is estimated at $8.4 million for goods and supplies. The project will have an annual payroll of approximately $10.1 million, which would include all salaries, overtime, benefits, and incentives. The payroll, local purchases, and sales tax revenues generated by the expenditures will likely have long-term beneficial effects on the San Bernardino County economy. (Exs. 1. p. 5.10-29; 300, p. C.10-19.)

Indirect and Induced Benefits. The project will also create indirect economic benefits and induced short-term employment in the study area. The Applicant used an Impact Analysis for Planning (IMPLAN) input-output model of the study area to estimate the project's multiplier effects associated with construction and operation. The IMPLAN results show that purchases by construction workers and permanent employees as well as project expenditures for materials and supplies will generate quantifiable secondary economic benefits that are likely to occur if the project is developed.

3. Environmental Justice Screening Analysis

Executive Order 12898, "Federal Actions to address environmental justice in Minority Populations and Low-Income Populations" requires state and federal agencies to incorporate environmental justice concerns in their environmental reports. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

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[1] California Revenue and Taxation Code, Section 73.

In energy siting cases, Commission staff uses a demographic screening analysis to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. The potentially affected area consists of a six-mile radius of the site and is consistent with air quality modeling of the range of a project's air quality impacts. The demographic screening is based on information contained in two documents: "*Environmental Justice: Guidance Under the National Environmental Policy Act*" (Council on Environmental Quality, December, 1997) and "*Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses*" (U.S. Environmental Protection Agency, April, 1998). The screening process relied on Year 2000 U.S. Census data to determine the presence of minority and below-poverty-level populations. (Ex. 300, p. C.10-5.)

The assessment included mapping the minority populations within the six-mile radius of the project site and reviewing the analysis for all of the technical issue areas addressed in the Calico Solar Project SA/DEIS. If minority populations are identified then the analysis also considers all potential impacts and mitigation measures and whether there would be a significant impact on a minority or low-income population. (Ex. 300, pp. C.10-4 and C.10-5.)

According to existing federal guidance, minority individuals are defined as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population, for the purposes of environmental justice, is identified when the minority population of the potentially affected area is greater than 50 percent or meaningfully greater than the percentage of the minority population in the general population or other appropriate unit of geographical analysis. (Ex. 300, p. C-10-5.)

The total population within the six-mile radius of the proposed site is 83 persons and the total minority population is 20 persons, or about 24 percent of the total population. (Ex. 300, p. C.10-5.) Therefore, we find that there are no environmental justice impacts related to the Calico Solar Project. (Ex. 300, pp. C.10-5 to C.10-6 and C.10-21.)

4. Cumulative Impacts

Cumulative socioeconomic impacts could occur when more than one project in the same area has an overlapping construction schedule, thus creating a demand for workers that cannot be met locally. An increased demand for labor

could result in an influx of non-local workers and their dependents, resulting in a strain on housing, schools, parks and recreation, law enforcement, and medical services. (Ex. 300, p. C-10-17.)

The evidence shows that the total construction labor force by MSA for the region is more than sufficient to accommodate the labor needs for construction of power generation facilities and other large industrial projects. Because of the robust local and regional construction labor force, the record concluded that there would be no influx of non-local workers and their dependents to the project area and no significant and adverse impacts on housing, schools, parks and recreation, law enforcement, and emergency medical services. Therefore, we find that construction and operation of the Calico Solar Project will not contribute to any significant adverse cumulative socioeconomic impacts. (Ex. 300, p. C-10-18.)

5. Facility Closure and Decommissioning

The solar generating facility is expected to have a lifespan of 40 years. Temporary closure would be a result of necessary maintenance, hazardous weather conditions, or damage due to a natural disaster. Permanent closure would be a result of damage that is beyond repair, adverse economic conditions, or other significant reasons. Both temporary and permanent closures would require the Applicant to submit and receive approval for a contingency plan or a decommissioning plan. (Exs.1, § 3.12; 300, p. C.10-20.)

Upon closure of the facility or decommissioning, the Applicant would be required to restore lands affected by the project to their pre-project state. The proposed project site is located on undeveloped land with current evidence of high levels of disturbance (due to OHV use). Given the temporary nature of decommissioning activities and the eventual return of the lands to their current state, we find that decommissioning would not adversely impact the socioeconomic characteristics of the project area.

6. Mitigation Measures/Proposed Conditions of Certification

Based on the evidence provided for the Calico Solar Project, we find that the project does not need Conditions of Certification for Socioeconomics and Environmental Justice. The project owner will comply with all applicable regulations.

FINDINGS OF FACT

Based on the uncontroverted evidence of record, we make the following findings:

1. A large, skilled labor pool in San Bernardino and Riverside Counties is available for construction and operation of the project.

2. Over the 44-month construction period, an average of approximately 400 construction workers a month, with a peak workforce of about 700 for month seven, will be needed.

3. The project will hire approximately 180 permanent, full-time employees mostly from the local area for project operations.

4. The project will not cause an influx of a significant number of construction or operation workers to permanently relocate to the local area because most of the workers would reside within commuting distance of the site. However, during operation, he Applicant does estimate that 20 workers may permanently relocate to the project area.

5. There is an adequate supply of motels and rental properties within the project vicinity to accommodate workers who stay in the area temporarily during their work assignments and return to their homes on hiatus.

6. The project will not result in significant adverse effects on local employment, housing, schools, parks and recreation, law enforcement, or emergency services.

7. The total capital cost of Calico Solar Project is estimated at $1 billion.

8. The total construction payroll for both phases of Calico Solar Project is estimated at over $159 million.

9. The anticipated construction payrolls, the local purchases of materials and supplies, and the sales tax revenues generated by the expenditures will have a temporary beneficial impact on the San Bernardino economy.

10. When both phases of Calico Solar Project are completed, the project will provide an annual operations payroll of approximately $10 million and an annual operations and maintenance budget estimated at over $8.4 million.

11. The project owner will not be required to pay the school development fee to the Silver Valley Unified School District because the main services complex would be constructed entirely on BLM land, and no private land will be affected.

12. The project will provide direct, indirect, and induced economic benefits to, San Bernardino County.

13. No minority population or low-income population within a six-mile radius of the project site exceeds the 50 percent threshold established in environmental justice guidance.

14. The project will not create disproportionate impacts on minority and/or low-income populations because the project did not result in any significant health or environmental impacts to any population in the project vicinity.

15. Construction and operation of the project will not result in any direct, indirect, or cumulative significant adverse socioeconomic impacts.

CONCLUSIONS OF LAW

1. We therefore conclude that implementation of all Conditions of Certification in this Decision ensures that the project will comply with all applicable laws, ordinances, regulations, and standards relating to socioeconomic factors as identified in the pertinent portions of **Appendix A**.

2. The project will not create any significant socioeconomic effects as defined under the National Environmental Policy Act or the California Environmental Quality Act.

3. The project will not create any disproportionate adverse effects on minority or low-income populations.

No Conditions of Certification are required.

D. NOISE AND VIBRATION

The construction and operation of any power plant create noise. A combination of factors such as loudness, time of day, and proximity to sensitive receptors determines whether the source of noise will cause significant adverse impacts. In some cases, vibration may be produced as a result of construction activities, such as blasting or pile driving, which may cause structural damage and annoyance. The discussion below summarizes the noise and vibration potentially produced by the construction and operation of the Calico Solar Project, and presents the recommended mitigation to reduce significant environmental impacts and comply with applicable law.

SUMMARY AND DISCUSSION OF THE EVIDENCE

The Calico Solar Project (Calico Solar) would be constructed on a 4,613 acre site located in San Bernardino County, approximately 37 miles east of the City of Barstow, California. The site is on undisturbed public land managed by the BLM. (Ex. 300, p. C.9-6.)

Noise sources in the project vicinity include train traffic, highway traffic, aircraft traffic, wind, and wildlife. Two sensitive receptors (two residences) were identified in the vicinity of the project site. The closest one is a single residence (SR1) located approximately 1,200 feet from the project's southwest border. A second residence (SR2) is located approximately 7,800 feet east of the project boundaries. (Exs. 1, §5.12.1.1, Figure 5.12 1; 300, p. C.9-6.)

The baseline used to compare predicted project noise to existing ambient noise was based on an applicant-prepared ambient noise survey (Exs. 1, §5.12.1.4; 300, p. C.9-7.) The survey was conducted from November 2 to November 7, 2008, and monitored existing noise levels at two locations near SR1. Existing ambient noise measurements were not taken at the second sensitive receptor because one of the measurements taken for SR1 was considered to be representative of the noise levels that could occur at SR2. (Ex. 300, p. C.9-7.) **Noise Table 1** provides the results of the ambient noise measurements.

Noise Table 1
Summary of Measured Ambient Noise Levels

Measurement Location	Measured Noise Levels, dBA		
	L_{eq} – Daytime[1]	L_{eq} – Nighttime[2]	L_{90} – Nighttime[3]
LT3/SR1	65	63	47
LT4/SR2	41	38	35

Source: Ex. 300, p. C-9-7
[1] Staff calculations of average of 10 daytime hours (Ex. 200, p. C-9-7.)
[2] Staff calculations of average of 8 nighttime hours (*Id*.)
[3] Staff calculations of average of 4 consecutive quietest hours of the nighttime (*Id*.)

1. Construction Noise

Construction noise is usually considered to be temporary. The Calico Solar Project will be constructed in two phases over a period of 41 months. (Exs.1, § 5.12.2.1; 300, p. C.9-8.) This construction timeframe is significantly longer than for a typical gas-fired power plant. However, the Applicant will construct the project in modular units. Each module will take approximately four months to construct. Thus, maximum construction noise would occur during the construction of the module closest to the receptor for a duration of four months and would decrease as construction activity moved on to other modules, further from the receptor. (Ex. 300, p. C.9-9.)

Aggregate construction noise may be expected to reach levels as high as 62 dBA L_{eq} at the sensitive receptor east of the project, SR2, for a period of approximately four months; an increase of 21 dBA during daytime hours (see **Noise Table 5**, above). At SR1 it would be even higher—74dBA. Such increases are substantial enough to be perceived as annoying at SR1 and SR2 and would generally be considered a significant impact. (Ex. 300, p. C.9-9.) However, construction noise levels at the sensitive receptors will diminish as modules are completed. The highest construction noise levels at those receptors will be for a period of four months. In addition, the San Bernardino County Development Code prohibits noisy construction activities at all times except from 7:00 a.m. to 7:00 p.m. Monday through Friday and altogether on Sundays and federal holidays. To ensure that these hours are enforced, we adopt Condition of Certification **Noise-6**, which requires compliance with this time restriction. (Ex. 300, p. C.9-9.)

In addition, we adopt Conditions of Certification **Noise-1** and **Noise-2** to require a notification process to alert residents to proposed project activities and a complaint process that requires the Applicant to resolve problems caused by project-related noise.

Linear facilities include two miles of new electrical transmission lines interconnecting a proposed new on-site substation to the transmission system on the project's eastern boundary. The transmission lines would not pass any sensitive receptors. While construction noise levels for these facilities will be noticeable, no particular area is exposed to noise for more than a few days. Further, construction activities would be limited to daytime hours. (Ex. 300, p. C.9-10.)

The only construction activity likely to produce vibration that could be perceived off-site would be pile driving. Although the Applicant did not identify pile driving as part of its application, noise associated with pile driving was evaluated. We adopt Condition of Certification **Noise-6** to ensure that pile driving will be limited to daytime hours. (Ex. 300, p. C.9-10.)

The Applicant acknowledges the need to protect construction workers from noise hazards and has recognized applicable LORS that would provide this protection to workers. (Ex. 1, § 5.12.2.1.) To ensure that construction workers are adequately protected, we adopt Condition of Certification **Noise-3**. (Ex. 300, p. C.9-10.)

With the implementation of the Conditions of Certification described above, we find that temporary noise impacts from construction of the Calico Solar Project would be less than significant.

2. Operational Noise

A power plant operates as a steady, continuous noise source. As such, power plant noise contributes to, and becomes part of, the background noise level. Where power plant noise is audible, it will tend to define the background noise. The primary noise sources of the project include the Stirling Engines (including generator, cooling fan, and air compressor), step-up transformers, and the new substation. (Ex. 300, p. C.9-11.)

The Applicant performed noise modeling to determine the project's noise impacts on sensitive receptors. **Noise Table 2** summarizes the results of this modeling.

Noise Table 2
Power Plant Operational Noise Impacts at Nearest Sensitive Receptors

Location	Power Plant Noise Level, dBA L_{eq}	Ambient Noise Level, dBA L_{eq}	Cumulative Noise Level, dBA	Change from Ambient Level dBA
SR1	57	65	66	+1
SR2	52	41	52	+11

Source: Ex. 300, p. C.9-12

As a solar thermal generating facility, the Calico Solar Project would operate only during daytime hours, typically 15 hours per day during the summer (with fewer hours during the fall, winter, and spring), when sufficient solar insolation is available. (Ex. 300, p. C.9-12.)

Power plant noise levels are predicted to be no greater than 57 dBA L_{eq} and 52 dBA L_{eq} at receptors SR1 and SR2, respectively, during daytime operation. When projected plant noise is added to the daytime ambient value, the cumulative level is higher than the ambient value at location SR1 by an inaudible amount (see **Noise Table 2**). The cumulative level at location SR2 is considerably higher, more than 10 dBA, than the ambient value. At night, no change in ambient noise at any sensitive receptor would result from plant operation. (Ex. 300, p. C.9-12.)

Daytime project-operating noise increases of up to 10 dBA are considered below the level of significance. In order for the cumulative level to be no more than 10 dBA over ambient at SR2, the project noise alone must not exceed 51 dBA at location SR2. Thus, we find that the Applicant's predicted noise level of 52 dBA must be reduced to 51 dBA, at SR2. We adopt Condition of Certification **Noise-4** to ensure that the project does not increase operational noise levels more than 10 dBA. (Ex. 300, p. C.9-12.)

Another source of disturbance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. The Applicant can avoid the creation of annoying tonal (pure-tone) noises by balancing the noise emissions of various power plant features during plant design. To ensure that tonal noises do not cause annoyance, we adopt Condition of Certification **Noise-4**. (Ex. 300, p. C.9-12.)

Noise effects from the electrical interconnection line typically do not extend beyond the right-of-way easement of the line. Therefore, we find that noise from the electrical interconnection would be inaudible to receptors. (Ex. 300, p. C.9-12.)

Vibration from an operating power plant could be transmitted by two chief means; through the ground (groundborne vibration) and through the air (airborne vibration). The operating components include a reciprocating engine, cooling fans, and air compressor. All of these pieces of equipment must be carefully balanced in order to operate. Given the distributive layout of the project, we find that the ground borne vibration from the Calico Solar Project would be undetectable by any likely receptor. (Ex. 300, p. C.9-13.)

Airborne vibration (low frequency noise) can rattle windows and objects on shelves and can rattle the walls of lightweight structures. None of the project equipment is likely to produce low frequency noise; this makes it highly unlikely that the Calico Solar Project would cause perceptible airborne vibration effects. (Ex. 300, p. C.9-13.)

The Applicant acknowledges the need to protect plant operating and maintenance workers from noise hazards and has committed to comply with applicable LORS. (Ex. 1, § 5.12.2.2.) To ensure that plant operation and maintenance workers are adequately protected, we adopt Condition of Certification **Noise-5**. (Ex. 300, p. C.9-13.)

3. Cumulative Impacts

Section 15130 of the CEQA guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, compound or increase the impact.

The Applicant identified two potential projects in the vicinity of Calico Solar that might cause cumulative noise impacts. The Applicant originally planned to propose an additional solar project (SES Solar Three) northwest of the Calico Solar project site. Subsequent to the AFC filing, the Applicant withdrew the Plan of Development for the SES Solar Three Project with the BLM and does not intend to develop the site. Another development is proposed west of the Calico Solar Project. The proposed solar project would be located on the opposite side of the Calico Solar Project site and the identified residences, and no significant

cumulative impact is expected. There is also a wind power facility that has been proposed to the east of the Calico Solar project site. Noise data from the proposed wind power facility is not available for the cumulative impact assessment. Additional projects outside the immediate vicinity of Calico Solar would not pose a potential for cumulative noise impacts. (Exs. 1, § 5.12.3; 300, p. C.9-19.) There is no evidence in the record that there are any other projects which, when combined with the Calico Solar Project, would have a cumulatively considerable effect on noise impacts in the project area.

4. Closure and Decommissioning

Upon closure of the Calico Solar Project, all operational noise from the project would stop, and no further adverse noise impact from its operation would be possible. The remaining potential temporary noise source would be the dismantling of the solar structures and equipment and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction, it can be similarly treated, that is, noisy work could be performed during daytime hours, with machinery and equipment properly equipped with noise-reducing devices. Any noise LORS that were in existence at that time would apply. Applicable Conditions of Certification included in the Energy Commission Decision would also apply unless modified. (Ex. 300, p. C.9-19.)

With the implementation of the Conditions of Certification described above, we find that noise impacts from decommissioning of the Calico Solar Project would be less than significant.

5. Compliance with Laws, Ordinances, Regulations and Standards (LORS)

In this section we discuss the project's compliance with applicable noise-related LORS. The applicable federal, state and local LORS are set forth in **Appendix A** of this Decision.

Construction of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours of the day is commonly exempt from enforcement by local ordinances.

The Applicant has predicted the noise impacts of project construction on the nearest sensitive receptors. A comparison of construction noise estimates to measured ambient conditions is summarized in **Noise Table 3**.

Noise Table 3
Predicted Power Plant Construction Noise Impacts

Receptor	Highest Construction Noise Level[1] (dBA L_{eq})	Measured Existing Ambient[2] (dBA L_{eq})	Cumulative (dBA L_{eq})	Change (dBA)
SR1 – South Residence	74	65 daytime	75 daytime	+10 daytime
		63 nighttime	74 nighttime	+11 nighttime
SR2 – East Residence	62	41 daytime	62 daytime	+21 daytime
		38 nighttime	62 nighttime	+24 nighttime

Source: Ex. 300, p. C.9-8.

The San Bernardino County Development Code exempts construction noise from established limits during the daytime hours of 7:00 a.m. to 7:00 p.m. except Sundays and federal holidays. To ensure that these hours are, in fact, enforced, we have adopted Condition of Certification **NOISE-6**.

Compliance with **NOISE-6** would insure that the noise impacts of Calico Solar Project construction activities would comply with the local noise LORS.

The Applicant performed noise modeling to determine the project's operational noise impacts on sensitive receptors. As seen in **Noise Table 4**, the project's operational noise level at the nearest sensitive receptor would be no more than 57 dBA L_{eq}. While this value exceeds the noise level limits specified in the San Bernardino County Development Code (55 dBA L_{eq} for residential receptors), it follows the stipulated allowable increase in noise level given that the measured daytime ambient level at that receptor (65 dBA L_{eq}) is greater than the stated limit, and is thus in compliance. The project's operational noise at the second sensitive receptor is below the specified LORS limit. The project's operational noise levels therefore comply with applicable LORS.

Noise Table 4
Plant Operating Noise LORS Compliance

Receptor	LORS	LORS Limit	Projected Noise Level (CNEL)
SR1	San Bernardino County Development Code	65 dBA L_{eq}, Existing Daytime Ambient	57 dBA
SR2		55 dBA L_{eq}, LORS Daytime Requirement	52 dBA

Source: Ex. 300, p. C.9-11.

The Applicant has committed to comply with applicable noise LORS intended to protect workers during construction and operation of the facility. We discuss these fully in the **WORKER SAFETY** section of this Decision.

6. Public and Agency Comments

Comments were received from the Applicant on the Noise and Vibration section. The Applicant provided text to clarify Conditions of Certification and to correct a reference in **Noise Table 1** of this Decision. Staff concluded that all clarifying text was appropriate and the corresponding changes were made. All of the comments were minor and did not change the original conclusions of the analysis. (Ex. 300, pp. C.9-19 to C.9-21.)

Based on the evidence, the Commission makes the following findings and reaches the following conclusions:

FINDINGS OF FACT

1. Construction and operation of the Calico Solar Project will not significantly increase noise levels above existing ambient levels in the surrounding project area.

2. Construction noise levels are temporary and transitory in nature and will be mitigated to the extent feasible by employing measures such as sound reduction devices and limiting construction to daytime hours in accordance with local noise control laws and ordinances.

3. Measures contained in the Conditions of Certification and compliance with local LORS will assure that noise from construction and operation is mitigated to below the level of significance.

4. Operational noise will not cause significant impacts to nearby residences.

5. The project owner will implement measures to protect workers from injury due to excessive noise levels.

6. The Calico Solar Project will not create ground or airborne vibrations, which cause significant off-site impacts.

7. Implementation of the Conditions of Certification identified below, ensure that project-related noise emissions will not cause significant impacts to sensitive noise receptors.

CONCLUSION OF LAW

1. The Commission concludes that implementation of the following Conditions of Certification ensure that the Calico Solar Project will comply with the applicable laws, ordinances, regulations, and standards on noise and vibration as set forth in the pertinent portion of **Appendix A** of this Decision, and that the project will not cause indirect, direct, or cumulative significant noise impacts.

CONDITIONS OF CERTIFICATION

NOTIFICATION OF NOISE COMPLAINT PROCESS

NOISE-1 At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within two miles of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project and include that telephone number in the above notice. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year. If construction outside the hours of 7:00 a.m. to 7:00 p.m. is required for any construction activity, the project owner shall provide an additional notice, to the CPM as well as to all residents within two miles of the site, by mail or other effective means, of the commencement and anticipated duration of the nighttime construction, at least 15 days prior to the commencement of the nighttime construction.

Verification: Prior to ground disturbance, the project owner shall transmit to the Compliance Project Manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed and describing the method of that notification, verifying that the telephone number has been established and posted at the site, and giving that telephone number.

NOISE COMPLAINT PROCESS

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise related to the complaint;
- Take all feasible measures to reduce the noise at its source if the noise is project related; and
- Submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts, and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within five days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form with the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a three-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

NOISE CONTROL PROGRAM

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program and a statement, signed by the project owner's project manager, verifying that the noise control program will be implemented throughout construction of the project. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal/OSHA standards.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit to the CPM the noise control program and the project

owner's project manager's signed statement. The project owner shall make the program available to Cal/OSHA upon request.

NOISE RESTRICTIONS

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the noise levels due to plant operation alone to exceed an average of 51 dBA L_{eq} measured at or near monitoring location SR2, and an average of 57 dBA L_{eq} measured at or near monitoring location SR1.

No new pure-tone components shall be caused by the project. "Pure-tone" shall be understood to mean, for purposes of this Condition, a prominent one-third octave band with prominence evaluated between adjacent one-third octave band project operation sound levels and using frequency-dependent prominence ratio criteria values similar to those as defined by ANSI S1.13-2005 A.8.6. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.

A. When the project first achieves a sustained output of 85 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring location SR2, or at a closer location acceptable to the CPM. This survey shall also include measurement of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been caused by the project.

B. During the period of this survey, the project owner shall also conduct a short-term survey of noise at monitoring location SL1 or at a closer location acceptable to the CPM. The short-term noise measurements at this location shall be conducted during morning, early afternoon, and evening hours.

C. The measurement of power plant noise for the purposes of demonstrating compliance with this Condition of Certification may alternatively be made at a location, acceptable to the CPM, closer to the plant (e.g., 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the affected residence. The character of the plant noise shall be evaluated at the affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

D. If the results from the noise survey indicate that the power plant noise at the affected receptor sites exceeds the above specified values, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

E. If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: The survey shall take place within 30 days of the project first achieving a sustained output of 85 percent or greater of rated capacity. Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limit, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this Condition.

OCCUPATIONAL NOISE SURVEY

NOISE-5 Following the project's first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility.

The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations sections 5095–5099 and Title 29, Code of Federal Regulations section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal/OSHA upon request.

CONSTRUCTION TIME RESTRICTIONS

NOISE-6 Heavy equipment operation, including pile driving, and noisy construction[1] work relating to any project features shall be restricted to

[1] Noisy Construction: "Noise that can potentially draw legitimate complaints."

Legitimate Complaint: "A legitimate noise complaint refers to a complaint about noise that is confirmed by the CPM to be disturbing, and that is caused by the Calico project as opposed to another source. A legitimate complaint constitutes a violation by the project of any noise condition of certification (as confirmed by the CPM), which is documented by an individual or entity affected by such noise."

the times of day delineated below, unless a variance has been issued by San Bernardino County for limited nighttime construction, unless:

- the project owner obtains the consent of the homeowners at SR1 and SR2; or

- the CPM determines that the noise will not exceed the daytime ambient noise levels at SR1 and SR2 (as shown in **Noise Table 5**) by more than 10 dBA and the nighttime ambient noise levels at SR1 and SR2 (as shown in **Noise Table 5**) by more than 5 dBA; or

- construction that is expected to increase those daytime ambient noise levels at those locations by more than 10 dBA continues no longer than four consecutive weekends or construction that is expected to increase nighttime ambient noise levels at those locations by more than 5 dBA continues no longer than five consecutive nights.

Mondays through Saturdays:	7:00 a.m. to 7:00 p.m.
Sundays and Holidays:	No Construction Allowed

Haul trucks and other engine-powered equipment shall be equipped with mufflers that meet all applicable regulations. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project. Prior to ground disturbance, a copy of the variance issued by the county, if one should be issued, shall be submitted to the CPM for review and approval.

At least 20 days prior to the start of construction activities to occur outside the above required schedule restrictions, the project owner shall submit to the CPM a letter showing the affected homeowner's consent. If the consent cannot be obtained, at least 15 days prior to the start of those activities, the project owner shall submit to the CPM documentation showing the expected construction noise levels at SR1 and SR2, the nature of the work, the time of day/night that work will occur, and the duration of the work.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Calico Solar Project (08-AFC-13)
NOISE COMPLAINT LOG NUMBER _____ Complainant's name and address: Phone number: _____
Date complaint received: _____ Time complaint received: _____
Nature of noise complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted: _____
Initial noise levels at 3 feet from noise source _____ dBA Date: _____ Initial noise levels at complainant's property: _____ dBA Date: _____ Final noise levels at 3 feet from noise source: _____ dBA Date: _____ Final noise levels at complainant's property: _____ dBA Date: _____
Description of corrective measures taken: Complainant's signature: _____ Date: _____
Approximate installed cost of corrective measures: $ _____ Date installation completed: _____ Date first letter sent to complainant: _____ (copy attached) Date final letter sent to complainant: _____ (copy attached)
This information is certified to be correct: Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required).

E. VISUAL RESOURCES

Visual resources are the features of the landscape that contribute to the visual character or quality of the environment. CEQA requires an examination of a project's visual impacts in order to determine whether the project has the potential to cause substantial degradation to the existing visual character of the site and its surroundings, substantially affect a scenic vista or damage scenic resources, or create a new source of substantial light or glare affecting day or nighttime views in the area. (Cal. Code Regs., tit. 14 § 15382, Appen. G.)

CEQA Guidelines Appendix G Environmental Checklist pertaining to "Aesthetics include the following:

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

In addition, we have evaluated potential impacts in relation to standard criteria described in detail in Appendix VR-1 of the Supplemental Staff Assessment. (Ex. 300, pp. C.13-46 to C. 13-48.) The evidence includes Staff evaluations of both the existing visible physical environmental setting, and the anticipated visual change introduced by the proposed project to the view from representative, fixed vantage points called "Key Observation Points" (KOPs). KOPs are selected to be representative of the most characteristic and most critical viewing groups and locations from which the project would be seen.

Staff experts testified regarding the likelihood of a visual impact exceeding Criterion C. of the CEQA Guidelines, above, by two fundamental factors: (1) the susceptibility of the setting to cause an impact as a result of its existing characteristics (reflected in its current level of visual quality, the potential visibility of the project, and the sensitivity to scenic values of its viewers); and, (2) the degree of visual change anticipated as a result of the project. These two factors are summarized respectively as *visual sensitivity* (of the setting and viewers), and *visual change* (due to the project) in the discussions below. KOPs with high sensitivity (due to outstanding scenic quality, high levels of viewer concern, etc.)

that experience high levels of visual change from a project are more likely to experience significant adverse impacts.

The National Environmental Policy Act (NEPA) requires that the federal government use “all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings” (42 U.S. Code 4331[b][2]).

Typically, U.S. Bureau of Land Management (BLM) evaluates visual effects of actions with the use of its Visual Resource Management (VRM) system. However, in the case of the area managed under the California Desert Conservation Area (CDCA) Plan (including this project), VRM classes were not assigned under that management plan. In the case of the Calico Solar Project (CSP) site, no current visual inventories by BLM are available, and no Interim VRM Classes have been assigned. The BLM is currently in the process of beginning visual inventories of areas within the CDCA that have not yet been inventoried, including this site. However, the results of those studies are not anticipated within the time frame of this project application, and delineations of scenic quality rating units or visual resource inventory classes are not available. Therefore, it was agreed by Staff for the Energy Commission and BLM that the analysis for the Calico Solar Project would be conducted using the Energy Commission’s standard visual assessment methodology.

Commission staff experts testified that, in their professional opinion, despite certain differences in approach and emphasis between the two methodologies, the assessment framework and impact thresholds of the Energy Commission method used in this study are substantially consistent with those typically applied by BLM under its own procedures. Staff thus considers that the conclusions of its analysis are substantially equivalent to those that would be reached by applying BLM-specific methods of visual assessment.

In addition, we have reviewed federal, state, and local LORS and their policies or guidelines for aesthetics or preservation and protection of sensitive visual resources that may be applicable to the project site and surrounding area. These LORS include local government land use planning documents (e.g., General Plan, zoning ordinance) and can be found in **Appendix A** of this Decision.

SUMMARY AND DISCUSSION OF THE EVIDENCE

1. Background Visual Features

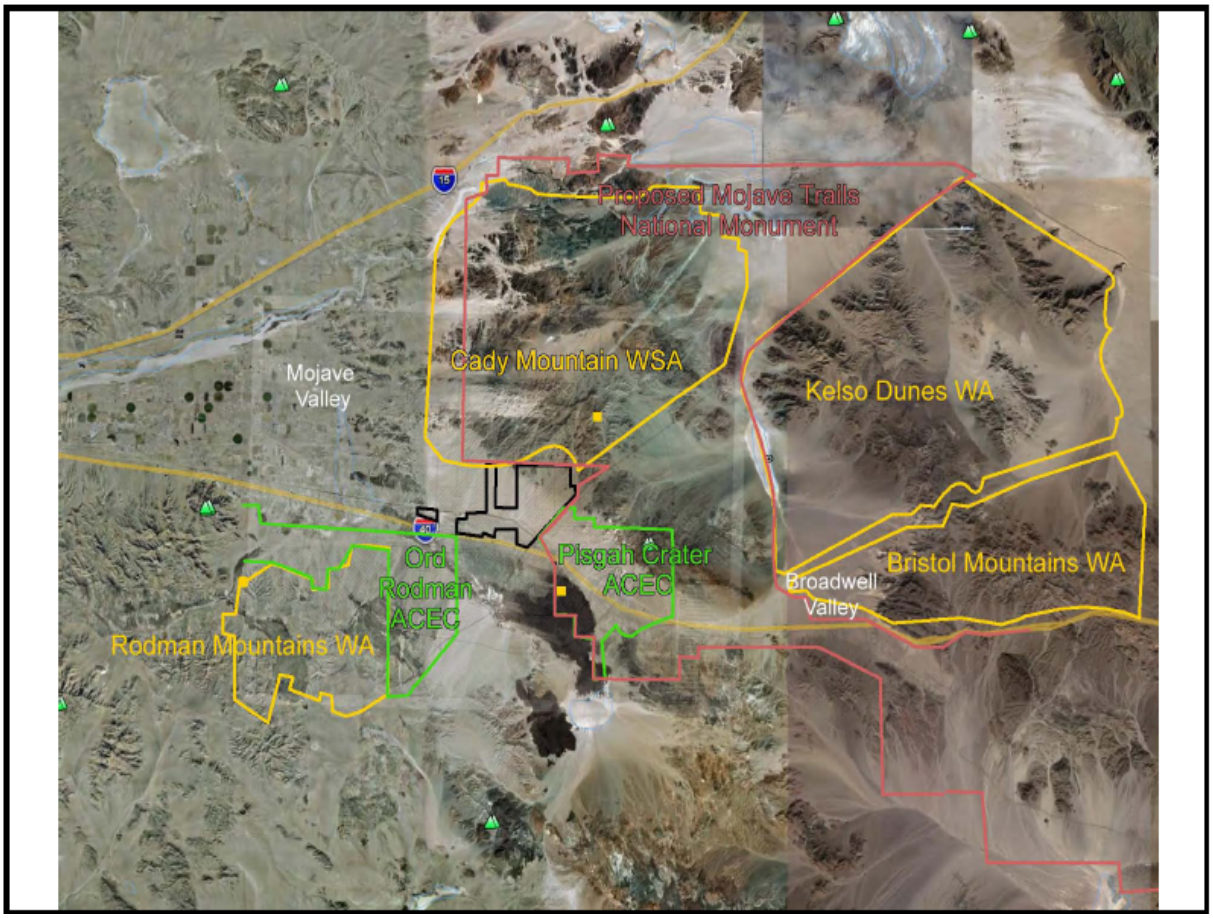
The proposed CSP would be built in the Mojave Desert in San Bernardino County. The site is roughly 37 miles east of the town of Barstow and 17 miles east of Newberry Springs. It is adjacent to the north side of Interstate 40 (I-40) and near the historic Route 66/National Trails Highway that generally parallels I-40 on the south in this area. The site is on BLM-administered land and is largely bounded by BLM-administered land, although private tracts abut some portions of the site and a Burlington Northern Santa Fe (BNSF) Railroad line traverses the site. (Ex. 300, p. C.13-3.)

The 84,400-acre Cady Mountain Wilderness Study Area borders the site on the north and the Pisgah Area of Critical Environmental Concern (ACEC) is adjacent to the site's eastern/southeastern boundary. The Kelso Dunes Wilderness and Bristol Mountains Wilderness are approximately 10 miles east of the site. Much of the Cady Mountain WSA and all of the Pisgah ACEC would be within in the Mojave Trails National Monument proposed as part of the proposed 2010 California Desert Protection Act legislation. The proposed monument would extend from the site's east boundary to near Needles. I-40 forms the southern boundary of the site. Three miles south of I-40 is the northern boundary of a closed live-fire training area on Twentynine Palms Marine Corps Base. Also south of I-40 and immediately southwest of the project site is the Ord-Rodman Desert Wildlife Management Area (DWMA). The Rodman Mountains Wilderness is three miles distant, also to the southwest. The west side of the site is bounded by undesignated BLM-administered land. **Visual Resources Figure 1,** Project Setting, depicts the project site in its immediate regional context in relation to these various protected areas. (Ex. 300, pp. C.13-3 to C.13-4.)

The site lies within the east-west trending Mojave Valley, a broad desert valley resting between the Cady and Bristol Mountains to the north and northeast and the Bullion, Lava Bed, Rodman, and Newberry Mountains to the south and southwest. The valley floor ranges from approximately 1,800 feet to 2,200 feet in elevation; the mountains rise to between 3,000 feet and 4,400 feet in elevation. (Ex. 300, p. C.13-4.)

Native vegetation cover of the region consists of sparse, low-growing green-to-tan Mojave creosote bush scrub typical of the western Mojave Desert.

Visual Resources – Figure 1
Calico Project – Project Setting



Source: Exhibit 300

The project site comprises approximately 4,613 acres of public land administered by the BLM. It does not include any private land except the site of the project's water well, adjacent to the BLM lands. Although not part of the project, three adjacent tracts of private land are each surrounded on three sides by the proposed project. The most prominent man-made features at or near the site are I-40, which abuts the site on the south, and the BNSF Railroad traversing the site. These features, though evident, remain visually subordinate to the vast open expanse of the site and surroundings. (Ex. 300, p. C.13-4.)

The site occupies a band of *bajadas*, or alluvial fans typical of the Mojave Desert landscape, which slope gently but noticeably southward toward the railroad and highway, from the feet of the prominently visible Cady Mountains immediately north of the site. The site is largely undisturbed and is currently managed by BLM as Multiple-Use Class (MUC) M (Moderate Use), except for a very small

portion along the northern boundary of the project, which is classified as MUC Class L (Limited Use). (Ex. 300, p. C.13-4.)

No communities lie within the project viewshed, which extends five miles from the site boundaries.[1] The project would be visible from various locations within the five-mile radius with the exception of mountainous areas to the north and east where terrain encloses views near the site boundary. The nearest rural residence is located about two miles east of the site. (Ex. 300, p. C.13-4.)

Visually, the primary CSP features to be introduced to the site are:

- 26450 40-foot solar dish Stirling systems (SunCatchers);
- Main Services Complex located generally in the center of the site for administration and maintenance activities, which would include buildings up to 78 feet in height, parking facilities, and access roads;
- Construction Staging/Laydown Area adjacent to the Main Services Complex for use during construction;
- Construction Staging/ Laydown Area adjacent to the eastern site boundary, near the existing power line and railroad;
- 220-kV Substation located generally in the center of the site, south of the Main Services Complex;

Linear facilities will include:

- 1.7-mile 220-kV transmission line connecting to the existing Southern California Edison (SCE) Pisgah Substation located at the southeast boundary of the project site;
- Three overhead 34.5-kV collection circuits to convey power to the substation within the project; and
- Approximately 25.2 miles of surface-treated roadways, approximately 168 miles of north-south access routes, and approximately 102 miles of east-west access routes. The access routes would be surface-treated to reduce fugitive dust while allowing full access to all dishes and infrastructure. (Ex. 300, pp. B.1-8; C.13-11.)

[1] A "viewshed" can be defined as the area from which the project can be seen, or which can be visually impacted by the project, and upon which the visual impacts analysis is based. KOPs will fall within the viewshed. An annotated map of the viewshed used for the Staff analysis is found in the Supplemental Staff Assessment. (Ex. 300, Visual Resources Figure 3.)

2. Direct/Indirect Impacts and Mitigation

a. Construction Impacts

Construction activities will occur over approximately 44 months. In addition to the facilities that will be constructed, there will be a temporary 14-acre construction staging/lay-down area adjacent to the Main Services Complex. (Ex, 300, p. B.1-8.)

Site grading would cause a significant visual impact during construction. Surface disturbance of the proposed site, as in most desert landscapes of the region, would result in high contrast between the disturbed area and surroundings, due to high contrast between the disturbed soil color and solar reflection (albedo), and the color and albedo of the existing undisturbed, vegetated surface. Mitigation of this impact is not feasible, because effectiveness of revegetation in this arid environment is difficult, of limited effectiveness, and capable of recovery only over a very long-term time frame. (Ex. 300, p. C.13-11.)

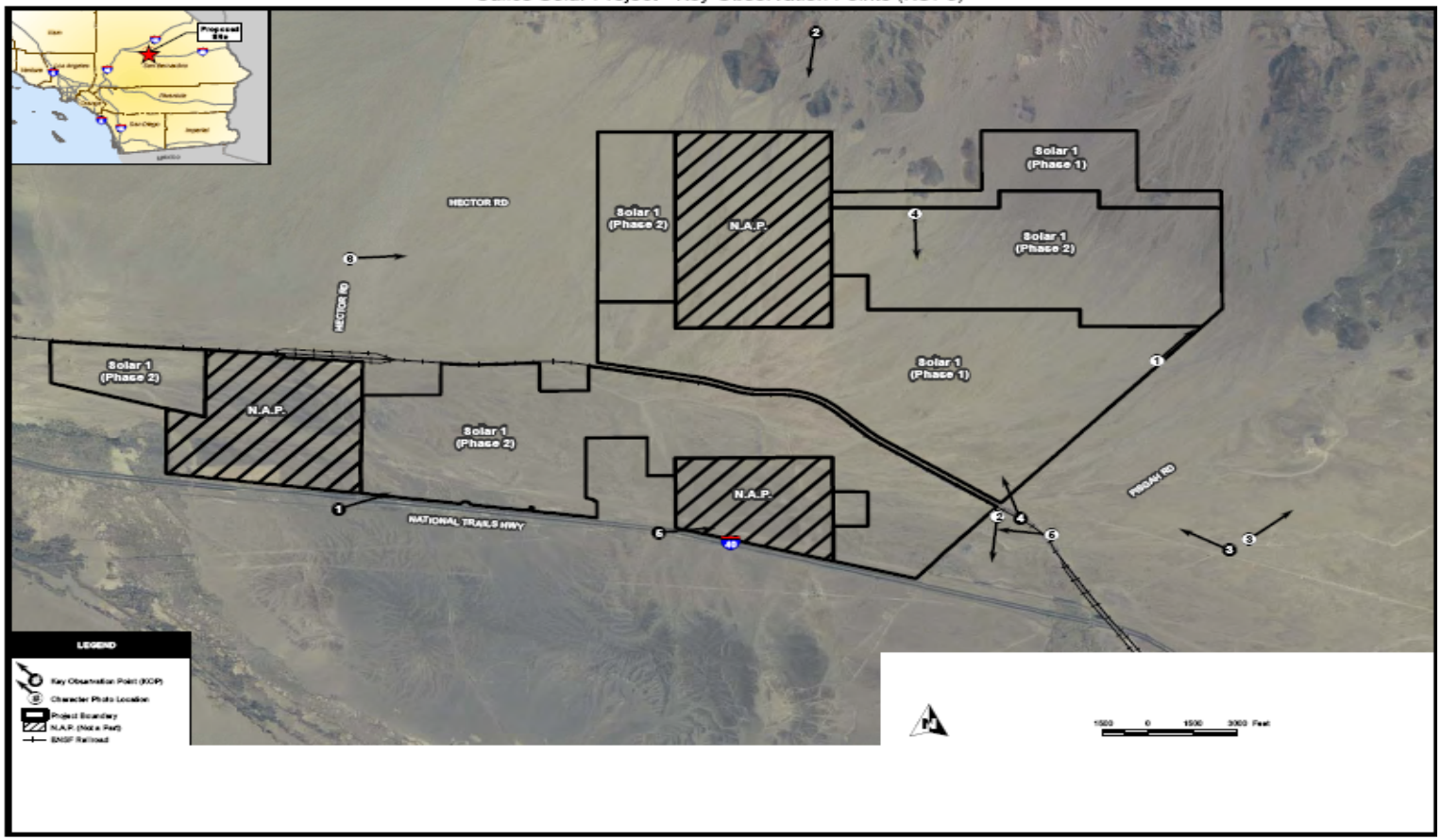
b. Operation Impacts

Visual Resources Figure 2 depicts the locations of the five KOPs selected for visual analysis:

- ***KOP 1*** – looking from a point along Route 66 looking generally northeast into the site across I-40.
- ***KOP 2*** – looking south into the site, from an elevated position just inside the Cady Mountain WSA.
- ***KOP 3*** – looking northwest toward the site from the vicinity of the nearest residence to the project.
- ***KOP 4*** – looking north into the site from where the BNSF Railroad crosses under an existing electric transmission line about 800 feet from the eastern edge of the site.
- ***KOP 5*** - view from I-40 eastbound, looking east-northeast across westbound I-40 into the site.

VISUAL RESOURCES FIGURE 2

Calico Solar Project - Key Observation Points (KOPs)



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: AFC Figure 5.13-2

Before considering individual KOPs, we consider generally whether the project will cause substantial degradation to the existing visual character of the site and its surroundings, substantially affect a scenic vista or damage scenic resources, or create a new source of substantial light or glare affecting day or nighttime views in the area [Cal. Code Regs., tit. 14, Appen. G, § I, subds. (a), (b) and (d)]. .(Ex. 300, p. C.13-21.)

A high level of viewer concern for scenic values was associated with the project viewshed as seen from the highway due to the eligible State Scenic Highway status of I-40 and the historic interest of Route 66. Views of the background mountains are the most scenic element of views from the highways in the project area, and these could potentially be blocked by the project, if the mirror units are sited sufficiently close to the highway. With recommended Condition of Certification **VIS-3,** those views would be preserved, though the foreground would be strongly altered by the vast array of mirror units, strongly attracting attention. With this measure, views would not be blocked, but the project's effect on the quality of those views would be strongly adverse and significant. (Ex. 300, pp. C.13-21 to C.13-22.) We judge this to be a significant, unmitigable visual impact.

The primary threat that Calico Solar Project poses to the visual environment is whether the project will substantially degrade the existing visual character or quality of the site and its surroundings [Cal. Code Regs., tit. 14, Appen. G, § I, subd. (c)]. The Commission's analysis of this issue involves examining the project from several Key Observation Points, or KOPs.

KOP 1 – Route 66/Interstate 40 (Figures 3A and 3B)

In the Energy Commission assessment approach, KOPs are rated according to the visual quality of their setting, and an assessment of their level of viewer concern and viewer exposure. Those three primary attributes are summarized in a KOP's *overall visual sensitivity* rating, which reflects an assessment of the overall susceptibility to visual impact of the viewer group/receptors it represents. These sensitivity ratings serve as the environmental baseline against which potential project impacts, measured in terms of level of *visual change*, are evaluated. KOP photos are selected to represent key sensitive viewer groups who would potentially be affected by the project. Project simulations are then imposed on these views to illustrate how the same view would appear with the project in place. In the discussion that follows, the reader is referred to these 'before project' photos.

KOP 1 is taken from Route 66 (National Old Trails Highway), which parallels I-40 slightly to the south in this segment. It receives relatively high levels of traffic (15,600 vehicles per day) (Ex. 1, p. 5.13-5). The KOP is fairly representative of motorists on both of these roadways, though it differs from typical views from I-40 in that the project is seen from Route 66 at a greater distance. The visual sensitivity of this KOP is moderately high. Existing scenic quality of this landscape is moderate. Although some visually compromising elements (including the highway, low-voltage utility lines, the BNSF rail line, and disturbance from a pipeline right-of-way) are present, these remain visually subordinate and the bajadas comprising the project site, descending from the intact and visually vivid Cady Mountains nearby, appear predominantly undisturbed and intact. However, viewer concern is moderately high since the focus of many Route 66/National Trails Highway users would be on the historic nature of this roadway and the encompassing landscape which earlier travelers would have experienced. Viewer concern[2] is also elevated by the I-40's state eligible scenic highway status. Viewer exposure[3] is high. (Ex. 300, p. C.13-12.)

Visual Resources Figures 3A and 3B depict a "before and after" view northward from Route 66 (National Trail Highway), at a foreground distance of less than 1,000 feet to the site. **Figure 3B** shows project simulations imposed on the existing view to illustrate how the same view would appear with the project in place. However, as discussed further below, the nearest SunCatcher units depicted in this simulation are located over 1,700 feet away. The range of actual view of the project would extend from foreground, throughout the middle-ground, to the background five miles distant. The project would appear very prominent, dominating the view from foreground locations on Route 66 and I-40. From such viewpoints near the project site, the project would strongly dominate the vista. (Ex. 300, p. C.13-13.)

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[2] "Viewer concern" represents the reaction of a viewer to visible changes in the viewshed — an area of land visible from a fixed vantage point. For example, viewers have a high expectation for views formally designated as a scenic area or travel corridor as well as for recreational and residential areas. Viewers generally expect that those views will be preserved.

[3] "Viewer exposure" is a function of three elements previously listed, *visibility*, *number of viewers*, and *duration of view*. Viewer exposure can range from a *low* to *high*. A partially obscured and brief background view for a few motorists represents a low value; and unobstructed foreground view from a large number of residences represents a high value.

Visual Resources – Figures 3A

Calico Solar Project – Existing view of project site from KOP 1 – Route 66/I-40

Source: Exhibit 300

Visual Resources – Figure 3B

Calico Solar Project – Simulated view of project site from KOP 1 – Route 66/I-40

Source: Exhibit 300

Project visual contrast[4] would be very strong. Texture and form contrast with the existing landscape of the vast rows of SunCatchers at this distance would be strong, lending a distinctly man-made, industrial character to the location. Color contrast with the existing natural environment would also be strong, and although the field could at times resemble a vast lake surface, reflecting the sky, at other times the mirrors are expected to appear very bright, to the point of representing a strong nuisance or distraction, though not a hazard to navigation. In addition, the long, linear, bright SunCatcher rows, which are oriented perpendicularly to the highway, would rapidly alternate with the darker-colored land between each row, introducing a large-scale flickering effect at the highway frontage that would compound the nuisance and distraction of glare for some viewers.

From some viewpoints, the taller buildings of the Main Services Complex (up to 77 feet tall) could be visible in the middle of the site, exhibiting some vertical form and line contrast and attracting attention, although at this distance they appear relatively inconspicuous. Likewise, poles for the electric collection system, though not depicted in the simulation of **KOP 1**, would be visible throughout the site and introduce vertical and horizontal elements of visual complexity that would detract from the visual unity of the scene and add to the overall industrial character. However, these features generally would be dwarfed by the vast scale and dominance of the SunCatcher fields. (Ex. 300, p. C.13-13.)

The project would exert extraordinary horizontal scale and spatial dominance, occupying a vast expanse of the landscape along nearly five miles of highway frontage. As depicted in the simulation, the overall proportion of the view occupied by the project would be extensive compared to the foreground terrain, background mountains, and sky, due to the sloping terrain and resulting site exposure. (Ex. 300, p. C.13-13.)

As depicted in the simulation of **KOP 1** (**Figure 3B**), the project does not physically block scenic views of the Cady Mountains in the distance from viewpoints along the highway. This feature of the simulation is discussed further, below. Nevertheless, overall visual change to viewers from Route 66 is high.

[4] "Contrast" concerns the degree to which a project's visual characteristics or elements —form, line, color, and texture — differ from the same visual elements in the existing landscape. The degree of contrast can range from *low* to *high*. A landscape with forms, lines, colors, and textures similar to those of a proposed energy facility is more visually absorbent; that is, more capable of accepting those characteristics than a landscape in which those elements are absent[4]. Generally, visual absorption is inversely proportional to visual contrast. (Ex. 300, p. C.13-48.)

This is because the project would demand attention, could not be overlooked, and would be dominant in the landscape. (Ex. 300, pp. C.13-13 to C.13-14.)

In the context of moderately high overall visual sensitivity[5], the high level of visual change experienced by the majority of Route 66 and I-40 viewers – those looking toward the project from **KOP-1** within foreground and near-middle-ground distance from the project – the impacts are significant. (Ex. 300, p. C.13-14.)

Condition of Certification **VIS-3**, Set-Back of SunCatchers from Highway I-40, would require siting of the SunCatchers to the north of the existing pipeline ROW, with a minimum set-back of the SunCatchers from the highway of 223 feet. With this measure, as depicted in **Figure 3B**, project effects would still remain substantial and continue to dominate the landscape. However, they would be considerably less than a project without these set-backs, because they would allow views of mountains from Highway I-40 and would reduce nuisance glare impacts. In addition, in order to reduce the contrast of non-mirror project features as seen from all off-site viewpoints, we required Condition of Certification **VIS-1,** Surface Treatment of Non-Mirror Project Structures[6]. With these measures, visual contrast and dominance of the project would be considerably reduced. However, visual contrast and dominance[7] of the projects would remain strong, and impacts would remain significant due to the project's high contrast with the natural dessert surroundings and its dominance of the surroundings for many viewers. (Ex. 300, p. C.13-15.)

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[5] "Visual sensitivity" is comprised of three elements previous listed, *visual quality*, *viewer concern*, and *viewer exposure*. Viewer sensitivity tends to be higher for homeowners or people driving for pleasure or engaged in recreational activities and lower for people driving to and from work or as part of their work. (Ex. 300, p. C.13-47.)

[6] Applicant argued that Condition **VIS-1** would be infeasible as applied to SunCatchers, since dark colors would allow excess heat buildup. However, Applicant states that other light colors are being investigated. If light colors that would blend with the background landscape are feasible, Applicant shall use light, non-white colors on the backs of SunCatchers in order to reduce visual contrast.

[7] *Dominance* is a measure of (a) the proportion of the total field of view occupied by the field; (b) a feature's apparent size relative to other visible landscape features; and (c) the conspicuousness of the feature due to its location in the view. A feature's level of dominance is higher if it is (1) near the center of the view; (2) elevated relative to the viewer; or (3) has the sky as a backdrop. As the distance between a viewer and a feature increases, its apparent size decreases; and consequently, its dominance decreases. The level of dominance ranges from *low* to *high*.

KOP 2 – Cady Mountains WSA (Figures 4A and 4B)

Visual Resources Figure 4A represents a view of the project site from **KOP 2** within the Cady Mountains WSA, as viewed from slightly over one-fourth mile from the northern boundary of the site, at an elevation of roughly 300 feet above the base of the nearest SunCatchers, and 500 feet above the BNSF rail line visible in the view. (Ex. 300, p. C.13-15.)

As represented in **Visual Resources Figure 4B** from **KOP 2**, project contrast at this distance would generally be moderate. Color and texture contrast with the existing landscape at this distance would be strong, lending a conspicuous, distinctly man-made character to the view. Form and line contrast, however, would be relatively weak, blending with the broad horizontal lines of the level terrain. (Ex. 300, p. C.13-16.)

In general, at this distance the project would exert strong horizontal scale and spatial dominance, occupying a vast extent of the landscape. Due to the viewshed characteristics in the Cady Mountains described above, however, visual dominance would vary considerably, as a function of visual exposure due to terrain. In the most exposed conditions, for example in the areas north of the proposed project area, viewers could overlook a panorama of up to eight square miles of SunCatchers or four times the area depicted in the simulation, with the nearest of these seen at foreground distance. From such viewpoints, project dominance would be very strong, occupying the largest part of the overall view and overshadowing all other elements. In other cases, as in the simulated view, where the preponderance of the project is hidden by terrain, contrast and dominance could be moderate, and the project would appear to be visually co-dominant with the background mountains. (Ex. 300, p. C.13-16.)

The project would not block scenic views, occupying the visual foreground of the background mountains, although it would block view of the natural valley floor. (Ex. 300, p. C.13-16.)

Visual Resources – Figure 4A

Calico Solar Project – Existing View of Project Site from KOP 2 – Cady Mountains WSA

Source: Exhibit 300

Visual Resources – Figure 4B

Calico Solar Project – Existing View of Project Site from KOP 2 – Cady Mountains WSA

Source: Exhibit 300

Visual change from **KOP 2** and similar middle-ground viewpoints would thus range from moderate to strong depending on location and distance. However, according to viewshed mapping, from the majority of locations at distances approaching a mile or more, visual exposure would decline due to intervening terrain, as would visual dominance due to distance. In view of the very scattered and intermittent visibility of the project predicted by viewshed mapping within the one- and two mile distance zones, the relatively low levels of visitation, the small proportion of the WSA that would be affected, and correspondingly limited view durations, overall visual change from the Cady Mountains is considered to be moderate. (Ex. 300, pp. C.13-16 to C.13-17.)

In the context of moderately high overall visual sensitivity, the moderate level of visual change experienced by visitors to Cady Mountains WSA at distances of over roughly one mile would be somewhat adverse. However, in view of the small proportion of the Cady Mountains WSA potentially affected at closer distances, overall impacts to viewers in the WSA are less than significant. (Ex. 300, p. C.13-17.)

No mitigation measures are considered necessary at distances of over roughly one mile. No measures are available for nearer viewpoints. Those nearer viewpoints are sufficiently intermittent and represent so small a proportion of the WSA, however, as not to require mitigation. (Ex. 300, p. C.13-17.)

KOP 3 - Eastside View of Project Site, Visual Resources (Figures 5A and 5B)

KOP 3 represents the view from the nearest residence to the project, situated approximately 1.5 miles to the east of the site (**Visual Resources Figure 5A)**. Based on the evidence, this viewpoint may be the only residence within the project viewshed and may thus be unique, and not representative of a larger viewer group. It is, however, informative of the appearance of the project at this distance. Staff testified that this simulation does not accurately convey the level of brightness expected from the face of the mirrors under typical conditions. (Ex. 300, p. C.13-17.)

Visual Resources – Figure 5A

Calico Solar Project – Existing View of Project Site from KOP 3 – Eastside View

Source: Exhibit 300

Visual Resources – Figure 5B

Calico Solar Project – Simulated View of Project Site from KOP 3 – Eastside View

Source: Exhibit 300

As illustrated in **Visual Resources Figure 5B**, at this distance the existing SCE 500-kV and 230-kV transmission line towers and poles are evident, though visually subordinate within the view. The line and towers do not intrude into the skyline due to the mountains in the background. The project would begin at the transmission line and extend away from the viewer. However, numerous towers and poles required by the project internal to the site would increase the degree of vertical form and line contrast with the horizontal landscape. The contrast of the combined transmission lines could attract attention and begin to dominate the characteristic landscape. Due to the relatively level grade/elevation relationship between the project and viewpoint, at this distance the project occupies a narrow portion of the overall field of view due to the oblique viewing angle. The reduced dominance due to oblique viewing angle is somewhat off-set however by the vast horizontal extent of the project from viewpoints at this distance, resulting in high spatial dominance; and by high contrast of anticipated mirror brightness under many extended, typical conditions. Although not obstructing views of the distant background, the extensive array of regularly spaced solar units along the project boundary would completely dominate the middle-ground. Accounting for the anticipated brightness of the mirror field for extended periods, and the strong horizontal spatial dominance of the project, overall visual change at this distance would be strong. The project would demand attention, could not be overlooked, and would be dominant in the landscape. (Ex. 300, p. C.13-17.)

In the context of moderate overall visual sensitivity from this and similar locations, due to low visual magnitude and very low viewer numbers, the moderately high level of anticipated visual change of the project is considered adverse but less than significant. (Ex. 300, pp. C.13-17 to C.13-18.)

No mitigation measures are considered necessary from **KOP 3**. (Ex. 300, p. C.13-18.)

KOP 4 - BNSF Railroad/I-40 West (Visual Resources Figures 6A and 6B)

Based on the evidence that Amtrak passengers service occurs only after dark, Amtrak passengers on the BNSF rail line were determined not to be sensitive receptors. However, **KOP 4** is retained to help convey the appearance of the project at foreground distance from similar viewpoints on I-40. (Ex. 300, p. C.13-18.)

Visual Resources – Figure 6A

Calico Solar Project – Existing View of Project Site from KOP 4 – BNSF and I-40 West

Source: Exhibit 300

Visual Resources – Figure 6B

Calico Solar Project – Simulated View of Project Site from KOP 4 – BNSF and I-40 West

Source: Exhibit 300

According to the photo location, the camera position is very roughly 700 - 800 feet from the project boundary. When compared to other simulations in which the SunCatchers are located at distances of one half mile or more, the difference in level of impact as a function of distance is apparent. In addition, **KOP 4** illustrates the effect of foreground views where grade relationships are relatively level. In such situations, the mirror units are likely to block and enclose views, as suggested by the simulation. (Ex. 300, p. C.13-18.) However, even with their mitigation, the visual impact from **KOP-4** is significant.

For most of the frontage of the project, I-40 is elevated in relation to the adjoining ground. However, that amount of elevation is not sufficient by itself to prevent the 38-foot-tall mirror units from blocking views and being highly dominant. Based on USGS topographic maps, however, elevations of the adjoining plain northward from the road edge tend to decrease along much of the highway frontage until the point of the BNSF rail line, which generally represents a low point. Thus, as indicated in simulations of **KOP 1** (**Visual Resources Figure 3B)** above, and **KOP 5** (**Visual Resources Figure 7B)**, below, sufficient set-backs from the highway are a critical factor in reducing the visual height and magnitude of the mirror units, and for preventing view blockage or enclosure from the highway by the mirror units. Condition of Certification **VIS-3** proposes siting of the SunCatchers to the north of the existing pipeline ROW, with a minimum set-back of the SunCatchers from the highway of 500 feet. (Ex. 300, p. C.13-18.)

KOP 5 – Interstate 40 Eastbound (**Visual Resources Figures 7A and 7B)**

KOP 5 represents near-middleground views of the project by motorists on I-40 eastbound. Because this view looks across foreground that is not a part of the project, it is not fully representative of what a viewer would experience while travelling on I-40, but depicts views along the roughly one mile section of excluded highway frontage. The viewpoint appears from **Visual Resources Figure 2** to be roughly one mile from the site. The simulation of **KOP 5** (**Visual Resources Figure 7B)** primarily depicts the south-easternmost corner of project Phase 2, covering an area of roughly two sections (square miles). (Ex. 300, p. C.13-18.)

At this set-back distance, the contrast and dominance of the project is substantially reduced when compared to **KOP 1** and, especially, to **KOP 4**. Similarly, the spatial dominance of the project appears much less than in **KOP 1** because the area depicted is considerably smaller. Based solely on this image one could conclude that the project could appear co-dominant with the surrounding landscape. (Ex. 300, p. C.13-18.)

Visual Resources – Figure 7A

Calico Solar Project – Existing View of Project Site from KOP 5 – Interstate 40 Eastbound

Source: Exhibit 300

Visual Resources – Figure 7B

Calico Solar Project – Simulated View of Project Site from KOP 5 – Interstate 40 Eastbound

Source: Exhibit 300

However, in order to fully understand the visual effect of the project from this or other viewpoints on I-40, it is important to recall that for approximately five miles the project fronts on I-40. In addition, the project would be visible for roughly three miles to the east of the project and for roughly five miles to the west of the project, particularly during morning and afternoon hours when diffuse reflection could be strongest. (**KOP 3** depicts the appearance of the project from a distance of roughly two miles). The view in the **KOP 5** simulation represents the greatest distance between the highway and the project at any point in the five miles of frontage. Over 80 percent of the frontage on I-40 could be as little as a few yards from the highway right-of-way. Thus, based on the evidence, a closer approximation of the I-40 experience is provided in KOPs 1 and 4, although as discussed, this would only be true assuming adoption of recommended Condition of Certification **VIS-3**. Without that measure, the project could potentially appear more prominent than depicted in **KOP 4** for a considerable portion of the I-40 frontage, because it could be located at a closer distance.

Similarly, although spatial dominance of the project in this image appears moderate, a rotation to the left from this same viewpoint would depict a view of most of the eight square miles of the proposed project behind the BNSF rail line, where the project would extend to its highest elevations at the foot of the Cady Mountains (up to an elevation of approximately 2,200 feet). At that angle, or in views from locations throughout the I-40 frontage directed toward the project, the view would resemble the simulation of **KOP 1**. Although the simulation is not necessarily inaccurate, the diffuse reflective brightness of the mirror fields would be substantially greater than depicted in this view for a substantial proportion of the day, increasing overall contrast accordingly.

Based on the evidence, the simulations of **KOPs 1** and **4** are more representative of the I-40 motorist's experience than **KOP 5** and together, more representative of the salient aspects of the project's visual characteristics. That is, with sufficient set-backs from the highway, most views from I-40 would resemble **KOP 1**, exposing the vast area of the mirror fields due to the sloping topography and exhibiting a highly unusual level of character contrast and spatial dominance. Without sufficient set-backs from the highway, the project would resemble the simulation of **KOP 4**. That is, visual height and magnitude of the individual SunCatchers would be great, collective diffuse glare could be strong, and there would be a potential for scenic view blockage and enclosure by the tall mirror units. That is, overall visual change to viewers from Route 66 is considered high. The project would demand attention, could not be overlooked, and would be dominant in the landscape.

In the context of moderately high overall visual sensitivity, the high level of visual change experienced by the majority of Route 66 and I-40 viewers – those within foreground and near-middle-ground distance from the project – project impacts are significant.

3. Impacts/Night Lighting[8]

Nuisance glare is a major issue of concern for the Calico Solar Project, primarily for aesthetic and comfort reasons. Affected receptors would be motorists on the highways; and hikers, climbers and other visitors in Cady Mountains WSA and associated open trails. Staff conducted an independent review of potential glare impacts based on field data of the SunCatcher test site in Maricopa, Arizona provided by the Applicant (refer to the **Transportation** section of this Decision for a detailed discussion on glare). With recommended Condition of Certification **VIS- 3** (set back of SunCatchers locations from I-40) and **TRANS-9**, impacts would be glaringly adverse, but would be reduced to less-than-significant levels for motorists in I-40. (Ex. 300, p. C.13-21.)

The project viewshed is now largely dark at night. The pristine, unlit night sky is an important part of the desert experience for many visitors to remote areas such as this. Unmitigated night lighting of the project is an adverse impact to the experience of campers in the nearby WSAs and other visitors to the area at night.

Night lighting of the Main Services Complex would consist of 400-watt high-pressure sodium lights, with illumination falling to 0.0 foot-candles on the ground a short distance from the facility. Parking and roadway lighting would consist of full cut-off luminaires to minimize night sky light pollution. Preliminary photometric studies depict illumination from these fixtures falling to 0.0 foot-candles a short distance from each roadway. (Ex. 300, p. C.13-20.)

However, night roadway lighting from tall light standards could be reflected into the SunCatchers in stow position at night, reflecting bright illumination skyward and causing night light pollution. (Ex. 300, p. C.13-20.) To reduce the impacts of nighttime glare from the project while also meeting safety and security lighting requirements, including construction lighting, Condition of Certification **VIS-2,**

[8] Please refer to the **Transportation** section of this Decision for a detailed discussion on glare impacts.

Temporary and Permanent Exterior Lighting requires design of project lighting to minimize skyward light reflection.

4. Cumulative Impacts and Mitigation

A project may result in a significant cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. (Cal. Code Regs., tit. 14, § 15130.)

There is the potential for substantial future development in the Mojave Desert area and throughout the southern California Mojave desert region. Known past, current and foreseeable future projects are summarized in the Cumulative Scenarios Section of the Staff's Analysis. (Ex. 300, pp. B.3-4 to B.3-13.)

Cumulative impacts occur if implementation of the CSP project would combine with those of other local or regional projects. The CSP project would have two types of cumulative impacts:

- cumulative impacts within the immediate project view shed, essentially comprising foreseeable future projects in the Mojave Desert area of San Bernardino County; and
- cumulative impacts of foreseeable future solar and other renewable energy projects within the southern California Desert, or other broad basin of the project's affected landscape type. The widest applicable basin of cumulative effect would include all of southern California Desert landscapes extending into neighboring states.

Past and present projects occurring in the viewshed of the proposed project site and affecting its existing visual quality consist of recreational activities managed by the BLM, SCE transmission lines, the Pisgah substation, utility lines, and the I-40 and Route 66 highways. (Ex. 300, p. C.13-30.)

The locations of existing and reasonably foreseeable developments in the vicinity of the CSP are presented in the Cumulative Scenario section of Exhibit 300 (pp.B.3-4 to B.3-13) listing foreseeable future projects within the project vicinity. The setting of the CSP is situated within a fairly limited local viewshed, enclosed by nearby mountains. Potential projects with the greatest potential for having cumulative visual impacts with the project are listed in **Figure 3** of Exhibit 300 and include the Pisgah-Lugo transmission upgrade, the Pisgah Substation Expansion, the renewable project next in line for the withdrawn SES Solar 3, Oak

Creek Wind Energy, and possibly the Power Partners wind project. These are the projects that appear to have the potential to directly interact with the Calico Solar Project visually. (Ex. 300, p. C.13-31.)

Because the evidence shows that the effects of the Calico Solar Project alone would have substantial visual impacts; cumulative impacts would also be significant. Even with the mitigation measures contained in the Conditions of Certification, the project would still contribute to a significant cumulative visual impact. Staff's Supplemental Staff Assessment Cumulative Impacts **Table 1** identifies 72 solar projects and 61 wind project applications with a total overall area of over one million acres within the CDCA. This figure does not include renewable projects within the Nevada and Arizona portions of the Mojave Desert. With this very high number of renewable energy applications currently filed with BLM, the potential for profound widespread cumulative impacts to scenic resources within the southern California is clear.

These cumulative impacts could include a substantial decline in the overall number and extent of scenically intact, undisturbed desert landscapes, and a substantially more urbanized character in the overall southern California desert landscape. In particular, the number of current renewable applications before the BLM and Energy Commission that could potentially be prominently visible from the desert region's major highways is proportionally high, and the proportion of those highways that could be affected is also high.. (Ex. 300, p. C.13-31.)

Within the broad Newberry Springs-Ludlow area of potential cumulative effect, the project in combination with foreseeable projects would have the effect of substantially degrading the overall visual quality of a slightly broader segment of Highway I-40. The segment of I-40 west of the CSP site is already considered to be visually compromised by development. However, the listed projects have the potential to further degrade a currently intact segment of I-40, which is listed as an eligible State Scenic Highway, from the CSP site eastward. This effect would be cumulatively significant, depending upon the details of the specific projects. (Ex. 300, p. C.13-31.)

5. Regional Projects

Staff asserts that cumulative viewed impacts across the entire Mojave Desert must be considered and concludes that the CSP project, when combined with past and foreseeable future projects will have significant visual impacts in the California portion of the Mojave Desert. (Ex. 300 pp. C.13-30 to C.13-32.)

We decline to cast such a wide net in our cumulative impact analysis. Staff's analysis demonstrates that is not possible to do more than speculate in general terms about the nature of regional impacts. (Ex. 300, pp. C.13-31 to C.13-32.) We find it appropriate to define a single area for the cumulative analysis, not the broader, regional areas as Staff suggests. That more localized area, for this topic is the project viewshed, which is discussed above. The concern over the denigration of viewsheds is adequately addressed by our analysis of direct and cumulative impacts to the project's viewshed.

6. LORS compliance

As is discussed in the LORS section of this Decision, the project will conform to all applicable laws, ordinances, regulations and standards relating to **Visual Resources**.

FINDINGS OF FACT

1. Construction will occur over approximately 44 months.
2. We have applied the Commission's standard visual assessment methodology to analyze visual impacts of the CSP. This approach was supported by experts for both the Commission staff and BLM.
3. CSP's new source of substantial light to nighttime views will be less than significant with the effective implementation of the Applicant's specified mitigation measures and Condition of Certification **VIS-2**.
4. As required by Condition of Certification **VIS-1,** all CSP equipment other than the solar arrays will have non-reflective surfaces and neutral colors such that the project structures will not be a source of substantial glare that could adversely affect daytime views.
5. The project's potential impacts on visual resources were analyzed from five defined key observation points (KOPs) at different locations surrounding the project site.
6. From **KOP-1**, taken at Route 66 (National Old Trails Highway), there will be a moderately high overall visual sensitivity, viewer exposure is high, and there is a high level of visual change and contrast against the natural setting experienced by the majority of Route 66 and I-40 viewers – those looking toward the project from **KOP-1** - within foreground and near-middle-ground distance from the project. Views of the project will dominate the surroundings.

7. Since the focus of many Route 66.Historic Trails Highway users is on the historic nature of the roadway environs, the expansive landscape, and the integrity of the view, the impacts of the project are significant.

8. From **KOP-1** the project will create a strong, adverse, unmitigable and significant visual impact.

9. All feasible mitigation measures have been adopted and other mitigation steps, such as a reduced-size project alternative, fail to mitigate visual impacts to a level of less than significant. The visual impacts that remain after applying all feasible mitigation, are those described in **Finding 6** and **7** above. We find these impacts are significant.

10. For **KOP-2**, which looks south across the project area from within the Cady Mountains WSA, visual change would range from moderate to strong depending on location and distance. In the most exposed views of the project, viewers would overlook a panorama of up to eight square miles of SunCatchers, with the nearest of these in the foreground, creating a strong visual impact. However, in view of the small proportion of the Cady Mountains WSA potentially affected at closer distances, overall impacts to viewers in the WSA are less than significant.

11. **KOP-3** represents the view from the nearest residence to the project but may be unique. Due to low visual magnitude and very low viewer numbers, the moderately high level of anticipated visual change of the project is considered adverse but less than significant.

12. **KOP-4** depicts the view from the BNSF rail line, looking northwest into the project's eastern boundary at a distance of roughly 800 feet. **KOP-4** closely resembles viewing conditions of I-40 motorists in close proximity to the project boundaries and, particularly, the SunCatcher units, along much of the I-40 project frontage. The visual intrusion is high profile, high contrast and interferes with distant views. We determine the visual impact to be significant.

13. **KOP-5** is a view northeastward from eastbound I-40 across the opposite lanes of I-40. Viewer concern is moderately high, due to an elevated level of concern with scenic values within the CDCA in general, and a high proportion of motorists on I-40 concerned with those scenic values. Viewer exposure is high; views are predominantly open and unobstructed over an extensive area, and the project site is viewed at foreground and middle-ground distance, along a highway frontage of roughly four miles. We determine the visual impact to be significant.

14. The project's impacts on views from the Cady Mountains Wilderness Study Area are less-than-significant.

15. Implementation of the CSP would substantially degrade the existing visual character and quality of the site and its surroundings, resulting in damage to scenic vistas and significant impacts to motorists on Highway Interstate 40 and National Trails Highway/Route 66.

16. Project impacts will be significant over an area of almost 10 square miles, including approximately five miles of frontage on I-40. Visual impacts to motorists on Highway I-40 are therefore significant.

17. The record contains mitigation measures which would greatly reduce, but not eliminate, impacts which would remain significant and unavoidable.

18. The record contains an analysis of a Reduced Acreage Alternative. While impacts of this alternative would be substantially less than those of the proposed project, the impacts would nevertheless remain significant.

19. The anticipated visual impacts, of both the Calico Solar Project and the Reduced Acreage Alternative, in combination with past and foreseeable future local projects in the immediate project viewshed, are cumulatively considerable, significant, and unavoidable.

20. We have limited our cumulative impacts analysis of the project to the localized area surrounding the CSP and the project viewshed. Our cumulative impacts analysis does not take in the entire Mojave Dessert.

CONCLUSIONS OF LAW

1. All feasible mitigation has been applied to the visual impacts of the project. Such mitigation reduces, but does not eliminate the project's significant visual impacts.
2. Feasible alternatives examined in the record would reduce, but not eliminate, significant visual impacts of the CSP project.
3. The evidence establishes that the project will substantially degrade the existing visual character and quality of the site and its surroundings
4. Based on expert testimony and the visual simulations imposing the project on **KOPs 1**, **3** and **5**, we conclude that significant, unmitigated visual impacts will remain after implementation of the Conditions of Certification.
5. The project will comply with all applicable laws, ordinances, regulations and standards regarding project design, architecture, landscaping, signage, and other requirements related to Visual Resources.

CONDITIONS OF CERTIFICATION

SURFACE TREATMENT OF NON-MIRROR PROJECT STRUCTURES AND BUILDINGS

VIS-1 To the extent feasible, the project owner shall treat all non-mirror surfaces of all project structures and buildings visible to the public such

that a) their colors minimize visual intrusion and contrast by blending with the existing tan and brown color of the surrounding landscape; b) their colors and finishes do not create excessive glare; and c) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive. This measure shall include coloring of security fencing with vinyl or other non-reflective coating; or with slats or similar semi-opaque, non-reflective material, to blend to the greatest feasible extent with the background soil.

The project owner shall submit for CPM review and approval, a specific Surface Treatment Plan that will satisfy these requirements. The treatment plan shall include:

A. A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes;

B. A list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each. Colors must be identified by vendor, name, and number; or according to a universal designation system;

C. One set of color brochures or color chips showing each proposed color and finish;

D. A specific schedule for completion of the treatment; and

E. A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated in the field, until the project owner receives notification of approval of the treatment plan by the CPM. Subsequent modifications to the treatment plan are prohibited without CPM approval.

Verification: At least 90 days prior to specifying to the vendor the colors and finishes of the first structures or buildings that are surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM for review and approval and simultaneously to San Bernardino County for review and comment. If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) for review and approval by the CPM before any treatment is applied. Any modifications to the treatment plan must be submitted to the CPM for review and approval.

Prior to the start of commercial operation, the project owner shall notify the CPM that surface treatment of all listed structures and buildings has been completed

and they are ready for inspection and shall submit to each one set of electronic color photographs from the same key observation points identified in (d) above. The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify a): the condition of the surfaces of all structures and buildings at the end of the reporting year; b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

TEMPORARY AND PERMANENT EXTERIOR LIGHTING

VIS-2 To the extent feasible and consistent with safety and security considerations, the project owner shall design and install all temporary and permanent exterior lighting so that:

a) lighting does not cause excessive reflected glare;

b) lighting does not illuminate the nighttime sky;

c) mounting heights and locations of all lighting fixtures, including roadway lighting, will not allow light to fall on the mirror surfaces of the SunCatchers in the stowed position,

d) illumination of the project and its immediate vicinity is minimized as to times of use and extent, and;

e) lighting on the exhaust stacks shall be the minimum needed to satisfy safety and security concerns.

Permanent night lighting shall comply with all applicable standards, practices, and regulations including, and specifically, the following Illuminating Engineering Society documents:

- RP-33-99 Lighting for Exterior Environments
- DG-13-99 Outdoor Lighting
- TM-1 0-00 Addressing Obtrusive Light (Urban Sky Glow and Light Trespass) in Conjunction with Roadway Lighting
- TM-1 5-07 Luminaire Classification System for Outdoor Luminaires

Verification: At least 30 days prior to ordering any exterior lighting, the project owner shall contact the CPM to show compliance with all of the above requirements. This shall include, but not be limited to, final lighting plans, fixture and control schedules, fixture and control cut sheets and specifications, a photometric plan showing vertical and horizontal footcandles at all property lines to a height of 20 feet, and the proposed time clock schedule.

Prior to construction and prior to commercial operation, the project owner shall notify the CPM that the installation of the temporary and permanent lighting has been completed and is ready for inspection. If after inspection the CPM notifies the project owner that modifications to the lighting are needed, within 30 days

after receiving the notification the project owner shall implement the modifications and notify the CPM when the modifications are competed and ready for inspection.

Within 48 hours of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form as specified in the Compliance General Conditions, including a proposal to resolve the complaint, and a schedule for implementation of the proposed resolution. The project owner shall notify the CPM within 48 hours after completing the resolution of the complaint. A copy of the complaint resolution form report shall be submitted to the CPM within 30 days and included in the Annual Report.

SETBACK OF SUNCATCHERS FROM HIGHWAY I-40

VIS-3 To reduce the visual dominance and glare effects of the SunCatchers to motorists on Highway I-40, the Applicant shall set back the nearest units to the area north of the existing pipeline right-of-way, and at a minimum distance of 223 feet from the edge of the roadway, whichever is greater.

Verification: At least 30 days prior to start of construction, the project owner shall present to BLM's Authorized Officer and the CPM a revised plan depicting how the proposed SunCatchers will be set back from the highway. If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval by the CPM.

The project owner shall not begin construction until receiving CPM approval of the revised plan.

VIII. OVERRIDE FINDINGS

Based on our analysis of the evidence in this proceeding, we find that the Calico Solar Project (CSP) will have significant direct and cumulative unmitigated environmental impacts, which are described in detail below.

The California Environmental Quality Act (CEQA) requires that we make certain findings before approving a project. We address the requirement as follows:

CEQA prohibits a public agency from approving a project which identifies one or more significant effects on the environment unless both of the following occur:

> "(a) The public agency makes one or more of the following findings with respect to each significant effect:
>
> > (1) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment.
> >
> > (2) Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency.
> >
> > (3) Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the environmental impact report.
>
> (b) With respect to significant effects which were subject to a finding under paragraph (3) of subdivision (a), the public agency finds that specific overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment."
> (Pub. Res. Code § 21081.)

1. Significant Project Impacts

In the Cultural Resources, Land Use, and Visual Resources sections of this Decision, we discuss in detail our findings that CSP will have the following significant environmental impacts:

- **Cultural Resources**. The CSP cumulative contribution to permanent long term, potentially unmitigable, adverse impacts to historic Route 66 in the project vicinity as a result of the physical degradation of and visual

intrusion on significant cultural resources on those sites and an overall net reduction in cultural resources in the area

- **Land Use**. The CSP project would permanently change the nature of land use at the project site from Government Special Public Limited Use and Moderate Use to an intensive utility use for the generation of power. Therefore, the combined effect of the overall cumulative past, present, and proposed and reasonably foreseeable projects, including the proposed project, in the desert region of San Bernardino County would adversely affect recreation and wilderness resources, resulting in a significant and unavoidable impact under CEQA

- **Visual Resources**. The CSP project will result in the installation of a large, industrial facility on a presently undeveloped (although partially disturbed) landscape. It will have significant unmitigable impacts to visual vistas from three of five vantage points used in our analysis. In addition it will, in combination with the other renewable energy projects proposed in the project's viewshed, make a cumulatively considerable contribution to significant cumulative visual impacts.

2. Project Benefits

The CSP, if constructed and operated as set forth in this Decision, will provide the following benefits to California and its residents:

- CSP will provide 663.5 MW of renewable energy power, which will assist in meeting California's Renewable Portfolio Standard, which specifies that retail sellers of electricity serve 20 percent of their load with renewable energy by 2010. (Pub. Util. Code, § 399.11 et seq.) Governor's Executive Order S-14-08 increased the requirement to 33 percent by 2020.

- Producing electricity from renewable resources provides a number of significant benefits to California's environment and economy, including improving local air quality and public health, reducing global warming emissions, developing local energy sources and diversifying our energy supply, improving energy security, enhancing economic development and creating jobs. (2009 CEC Integrated Energy Policy Report, page 231.)

- Scientific studies quantify the negative impacts of global climate change to California's and the world's population, environment, food supplies, flora and fauna, coastal regions, and public health. In order to reduce the impact, the State has adopted goals to reduce greenhouse gas (GHG) emissions through, among other things, renewable energy development.

- CSP will assist the state in meeting its ambitious GHG reduction targets by generating 709 MW of electricity with substantially lower greenhouse gas emissions than existing fossil fuel burning generating facilities.

- In its June 2010, Staff Report on California's Renewable Electricity Standard, Initial Statement of Reasons, the California Air Resources Board (CARB) estimates that the environmental benefits resulting from a 20 percent renewable energy goal in 2020 are as follows:

    a. GHG reductions from California's electricity sector by at least 12 million metric tons of carbon dioxide equivalent ($MMTCO_2E$) in 2020, making renewable energy development one of California's largest GHG emission reduction strategies.

    b. The overall GHG emission benefit from adding wind and solar generation is 830 lbs CO_2e per MWh (GHG emissions from displaced or avoided fossil fuel generation) minus emissions from combustion turbines used to backup wind and solar generation.

    c. Reductions in statewide criteria pollutant emissions by five to 10 percent. These criteria pollutants under the Clean Air Act include reactive organic gas (ROG), NO_x, SO_x, CO, and $PM_{2.5}$. Most of the pollutant reductions result from decreased generation by existing natural gas plants. These reductions, in turn, should lead to reductions in the incidence of a variety of adverse health impacts.

    d. Decreased statewide emission of toxic air contaminants (TACs) as fossil-fuel power generation - including coal, once-through cooled, and natural gas generation - is displaced by renewable generation.

- By generating electricity through the use of solar energy, CSP will reduce California's dependence on fossil fuels.

- CSP will provide construction jobs for an average and peak workforce of 400 and 700, respectively, and approximately 180 jobs during operations. Most of those jobs will require highly trained workers.

- Construction and operation of CSP will add to the economy a $159 million construction payroll over 44 months, a local annual operation payroll of $10.1 million, sales and use taxes during construction of $623,100 and during operation of $387,500 annually. An estimated $8.4 million would be spent annually for local operations and maintenance.

- Additional indirect economic benefits, such as employment in local service industry jobs and induced employment, will result from these expenditures associated with the construction and operation of CSP.

3. Comparison of Project Alternatives

As discussed in the Alternatives section, the Reduced Acreage Alternative would reduce many of the impacts of the proposed project, but in doing so would reduce the project's benefits of replacing fossil fuel fired generation and reducing associated criteria pollutant and greenhouse gas emissions. The Private Lands alternative, while reducing the biological, cultural, and visual impacts of the proposed project, would have greater land use and noise impacts and be difficult to implement in the time desired due to the need to assemble upwards of 100 separate parcels with nearly 50 separate owners. The No Project alternative, while the environmentally superior alternative, fails to achieve any of the project objectives. Distributed solar energy (photovoltaic or thermal) generation and other renewable technologies are required *in addition to* large scale projects such as this in order to meet our renewable energy and GHG policy goals; the two complement, rather than compete with, each other.

4. Site Characteristics

The CSP project will be constructed on an approximate 4,613-acre site located in San Bernardino County, California. The project site is approximately 37 miles east of Barstow, 17 miles east of Newberry Springs, 57 miles northeast of Victorville, and approximately 115 miles east of Los Angeles. The project location includes several linear development features including I-40, BNSF railway, and SCE transmission lines. Additionally, the area between the BNSF railroad and I 40 is isolated by the highway and railroad and portions of the site have been subject to repeated disturbance from pipeline development. Besides these features, the project area is primarily open land ranging in elevation from approximately 1,925 to 3,050 feet (587 to 930 m) above mean sea level.

5. Official Notice

In arriving at the following findings, we have taken official notice of the following documents:

- The California Renewables Portfolio Standard (RPS) was created in 2002 under Senate Bill 1078 and further accelerated in 2006 under Senate Bill 107. The RPS program requires electric corporations to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they reach 20 percent by 2010.

- EXECUTIVE ORDER S-21-09 was signed by Governor Arnold Schwarzenegger establishing the 33 percent Renewable Electricity Standard.
- Climate Action Team Report to Governor Schwarzenegger and the Legislature. CalEPA, March 2006.
- AB 32 Scoping Plan. CARB, December 2008.
- Integration of Renewable Resources. CAISO, Nov. 2007.
- 2007 Integrated Energy Policy Report. CEC, Nov. 2007.
- 2009 Integrated Energy Policy Report. CEC. Nov. 2009.
- California Air Resources Board Staff Report on California's Renewable Electricity Standard, Initial Statement of Reasons, June 2010.
- Draft Final Opinion on Greenhouse Gas Regulatory Strategies:
    - Joint Agency Proposed Final Opinion. CPUC/CEC 2008.
- Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California. CEC (MRW and Associates). May 2009.

Based upon the above documents, evidence and Staff recommendations, we find that overriding considerations warrant the approval of the project as mitigated through the Conditions of Certification we adopt herein. We further find that the project is required for public convenience and necessity and that there are no more prudent and feasible means of achieving such public convenience and necessity.

FINDINGS OF FACT

Based on the evidence and the conclusions drawn in other sections of this Decision, we make the following findings and conclusions:

1. Climate change poses a serious threat to the economic well-being, public health, natural resources, and the environment of California.

2. The proposed project will have the following impacts which cannot be mitigated to insignificant levels:

    a. A cumulative contribution to permanent long term, potentially unmitigable, adverse impacts to historic Route 66 in the project vicinity as a result of

the physical degradation of and visual intrusion on significant cultural resources on those sites and an overall net reduction in cultural resources in the area

b. A permanent change the nature of land use at the project site from Government Special Public Limited Use and Moderate Use to an intensive utility use for the generation of power. The combined effect of the overall cumulative past, present, and proposed and reasonably foreseeable projects, including the proposed project, in the desert region of San Bernardino County would significantly impact recreation and wilderness resources.

c. The installation of a large, industrial facility on a presently undeveloped (although partially disturbed) landscape will have significant unmitigable impacts to visual vistas in the project vicinity. In addition it will, in combination with the other renewable energy projects proposed in the project's viewshed, make a cumulatively considerable contribution to significant cumulative visual impacts to the viewshed.

3. This Decision will result in mitigation of all direct project impacts for CSP, except to Land Use and Visual and Cultural Resources, as noted above, and imposes all feasible mitigation measures to reduce the significant direct impacts of the project below a level of significance.

4. This Decision will result in mitigation of all cumulative project impacts for CSP, except to Land Use and Visual and Cultural Resources, as noted above, and imposes all feasible mitigation measures to reduce the project's contribution to cumulative impacts to insignificant levels.

5. The project will provide the following benefits:

    a. Contribution of 663.5 MW of renewable energy power toward meeting California's Renewables Portfolio Standard and California's adopted renewable energy and GHG policy goals.

    b. A significant reduction in greenhouse gas emissions when compared with existing fossil fuel-burning generating facilities.

    c. Other important benefits to California's environment and economy include improving local air quality and public health, developing local energy sources, and diversifying our energy supply.

    d. Reduction of California's dependence on fossil fuels.

    e. Boost the economy due to the purchase of major equipment, payroll, and supplies, and increased sales tax revenue. Additional indirect economic benefits, such as indirect employment, and induced employment, will result from these expenditures as well.

f. CSP will provide construction jobs for an average and peak workforce of 400 and 700, respectively, and approximately 180 jobs during operations. Most of those jobs will require highly trained workers.

6. The CSP is in the vicinity of existing development including Interstate 40, BNSF Railway, and existing electricity infrastructure including major transmission lines.

CONCLUSIONS OF LAW

1. The CSP project benefits outweigh the significant direct and cumulative impacts identified above.

2. It is appropriate to approve the CSP despite its remaining significant environmental impacts.

3. As shown in the record, much of the debate over the CSP project was over the impacts to biological resources, specifically the federally-listed threatened species, desert tortoise and special-status plants found on the project site. There was general agreement by wildlife, botanical, and ecology experts that testified at the evidentiary hearings that there is a combination of both natural and manmade processes that are affecting the global climate; and that these special-status species are not immune to the effects of climate change, but it is possible that they could adapt and survive if given enough time. There was also general agreement that the exact impacts of climate change to the biological resources are unknown – various models predict varying temperature changes and precipitation amounts for California's desert region – resulting in potential detriment or benefit to biological resources, depending on the habitat needs of the species. It is the intent of this Commission to take all reasonable measures to preserve the continued existence of the desert special-status species. This Commission believes that this project, and other renewable energy projects, will result in the reduction of greenhouse gases which will help curb or reduce the impact of climate change to California, thereby allowing for the continued existence of the desert special-status species.

4. Therefore, this decision overrides the remaining significant unavoidable impacts that may result from this project, even with the implementation of the required mitigation measures described in this Decision.

Appendix A: *Laws, Ordinances, Regulations, and Standards*

Appendix B: *Exhibit List*

Appendix C: *Proof of Service List*

APPENDICES

AIR QUALITY

Applicable LORS	Description
Federal	
40 Code of Federal Regulations (CFR) Part 52	Nonattainment New Source Review (NSR) requires a permit and requires Best Available Control Technology (BACT) and Offsets. Permitting and enforcement delegated to Mojave Desert Air Quality Management District (MDAQMD). Prevention of Significant Deterioration (PSD) requires major sources or major modifications to major sources to obtain permits for attainment pollutants. The Calico Solar Project is a new source that does not have a rule listed emission source thus the PSD trigger levels are 250 tons per year for NOx, VOC, SOx, PM10, PM2.5 and CO.
40 CFR Part 60	New Source Performance Standards (NSPS), Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Establishes emission standards for compressions ignition internal combustion engines, including emergency fire water pump engines.
40 CFR Part 93 General Conformity	Requires determination of conformity with State Implementation Plan for Projects requiring federal approvals if project annual emissions are above specified levels.
State	
Health and Safety Code (HSC) Section 40910-40930	Permitting of source needs to be consistent with Air Resource Board (ARB) approved Clean Air Plans.
HSC Section 41700	Restricts emissions that would cause nuisance or injury.
California Code of Regulations (CCR) Section 93115	Airborne Toxics Control Measure for Stationary Compression Ignition Engines. Limits the types of fuels allowed, established maximum emission rates, establishes recordkeeping requirements on stationary compression ignition engines, including emergency fire water pump engines.
Local (Mojave Desert Air Quality Management District, MDAQMD)	
Rule 201 and 203 Permits Required	Requires a Permit to Construct before construction of an emission source occurs. Prohibits operation of any equipment that emits or controls air pollutant without first obtaining a permit to operate.
Rules 401, 402, 403, and 403.2 Nuisance, Visible Emissions, Fugitive Dust	Limits the visible, nuisance, and fugitive dust emissions and would be applicable to the construction period of the project.
Rule 404 Particulate Matter - Concentration	Limits the particulate matter concentration from stationary source exhausts.
Rule 406 Specific Contaminants	The rule prohibits sulfur compound emissions in excess of 500 ppmv.
Rule 407 Liquid and Gaseous Air Contaminants	The rule prohibits carbon monoxide emissions in excess of 2,000 ppmv.
Rule 409 Combustion Contaminants	Limits the emissions from fossil fuel combustion.

Applicable LORS	Description
Rule 431 Sulfur Content of Fuels	Limits the sulfur content of liquid fuels to no more than 0.5% by weight.
Rule 461 Gasoline Transfer and Dispensing	This rule specifies the vapor recovery requirement for gasoline tank filling (Phase I) and vehicle refueling (Phase II) for gasoline storage and refueling facilities.
Rule 900 Standard of Performance for New Stationary Source	Incorporates the Federal NSPS (40 CFR 60) rules by reference.
Rule 1303 New Source Review	Specifies BACT/Offsets technology and requirements for a new emissions unit that has potential to emit any affected pollutants.
Rule 1306 Electric Energy Generating Facilities	Describes actions to be taken for permitting of power plants that are within the jurisdiction of the Energy Commission.

GREENHOUSE GAS

Applicable LORS	Description
Federal	
40 Code of Federal Regulations (CFR) Part 98	This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2 equivalent emissions per year.
State	
California Global Warming Solutions Act of 2006, AB 32 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)	This act requires the California Air Resources Board (ARB) to enact standards that will reduce GHG emission to 1990 levels by 2020. Electricity production facilities will be regulated by the ARB.
California Code of Regulations, tit. 17, Subchapter 10, Article 2, sections 95100 et. seq.	These ARB regulations implement mandatory GHG emissions reporting as part of the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)
Title 20, California Code of Regulations, section 2900 et seq.; CPUC Decision D0701039 in proceeding R0604009	The regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tonnes carbon dioxide per megawatt-hour (0.5 $MTCO_2$/MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lbs CO_2/MWh).

ALTERNATIVES

California Environmental Quality Act (CEQA)

Energy Commission staff is required by agency regulations to examine the "feasibility of available site and facility alternatives to the Applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment." (Cal. Code Regs., tit. 20, § 1765.)

The "Guidelines for Implementation of the California Environmental Quality Act," Title 14, California Code of Regulations, Section 15126.6(a), requires an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project."

In addition, the analysis must address the No Project Alternative. (Cal. Code Regs., tit. 14, § 15126.6[e].) The analysis should identify and compare the impacts of the various alternatives, but analysis of alternatives need not be in as much detail as the analysis of the proposed project.

The range of alternatives is governed by the "rule of reason," which requires consideration only of those alternatives necessary to permit informed decision making and public participation. CEQA states that an environmental document does not have to consider an alternative if its effect cannot be reasonably ascertained and if its implementation is remote and speculative. (Cal. Code Regs., tit. 14, §15126.6[f][3].) However, if the range of alternatives is defined too narrowly, the analysis may be inadequate (*City of Santee v. County of San Diego* [4th District, 1989] 214 Cal. App. 3d 1438).

BIOLOGICAL RESOURCES

Applicable LORS	Description
FEDERAL	
Federal Endangered Species Act (Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and provides for protection of threatened and endangered plant and animal species and their critical habitat. “Take” of a federally-listed species is prohibited without an incidental take permit, which may be obtained through Section 7 consultation (between federal agencies) or a Section 10 Habitat Conservation Plan.
Migratory Bird Treaty Act (Title 16, United States Code, sections 703 through 711)	Makes it unlawful to take or possess any migratory bird (or any part of such migratory bird including active nests) as designated in the Migratory Bird Treaty Act unless permitted by regulation (e.g., duck hunting).
Clean Water Act (Title 33, United States Code, sections 1251 through 1376, and Code of Federal Regulations, part 30, section 330.5(a)(26))	Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the U.S. Army Corps of Engineers (USACE) for a discharge from dredged or fill materials into waters of the U.S., including wetlands. Section 401 requires a permit from a regional water quality control board (RWQCB) for the discharge of pollutants. By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request State certification that the proposed activity will not violate State and federal water quality standards.
Bald and Golden Eagle Protection Act (Title 16, United States Code section 668)	Provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the take, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the act.
California Desert Conservation Area Plan 1980, as amended (reprinted in 1999)	Administered by the BLM, the CDCA Plan requires that proposed development projects are compatible with policies that provide for the protection, enhancement, and sustainability of fish and wildlife species, wildlife corridors, riparian and wetland habitats, and native vegetation resources.
California Desert Protection Act of 1994	An Act of Congress which established 69 wilderness areas, the Mojave National Preserve, expanded Joshua Tree and Death Valley National Monuments and redefined them as National Parks. Lands transferred to the National Park Service were formerly administered by the BLM and included significant portions of grazing allotments, wild horse and burro Herd Management Areas, and Herd Areas.
West Mojave Plan	As an amendment to the CDCA Plan, the BLM produced the West Mojave Plan (WEMO) (BLM 2006). The WEMO is a federal land use plan amendment that (1) presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel (MGS) and nearly 100 other plants and animals and the natural communities of which they are part, and (2) provides a streamlined program for complying with the requirements of the California and federal Endangered Species Acts” (BLM et al. 2005).

Applicable LORS	Description
STATE	
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Protects California's rare, threatened, and endangered species. "Take" of a State-listed species is prohibited without an Incidental Take Permit.
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals of California that are declared rare, threatened, or endangered.
Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515)	Designates certain species as fully protected and prohibits the take of such species or their habitat unless for scientific purposes (see also California Code of Regulations, Title 14, section 670.7).
Nest or Eggs (Fish and Game Code section 3503)	Protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.
Birds of prey (Fish and Game Code section 3503.5)	Birds of prey are protected in California making it "unlawful to take, possess, or destroy any birds of prey (in the order Falconiformes or Strigiformes)."
Migratory Birds (Fish and Game Code section 3513)	Protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds.
Significant Natural Areas (Fish and Game Code section 1930 et seq.)	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.
California Environmental Quality Act (CEQA), CEQA Guidelines section 15380	CEQA defines rare species more broadly than the definitions for species listed under the State and federal Endangered Species Acts. Under section 15830, species not protected through State or federal listing but nonetheless demonstrable as "endangered" or "rare" under CEQA should also receive consideration in environmental analyses. Included in this category are many plants considered rare by the California Native Plant Society (CNPS) and some animals on the CDFG's Special Animals List.
Streambed Alteration Agreement (Fish and Game Code sections 1600 et seq.)	Regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFG in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process.
California Native Plant Protection Act of 1977 (Fish and Game Code section 1900 et seq.)	Designates State rare, threatened, and endangered plants.
California Desert Native Plants Act of 1981 (Food and Agricultural Code section 80001 et seq. and California Fish and Game Code sections 1925-1926)	Protects non-listed California desert native plants from unlawful harvesting on both public and private lands in Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego counties. Unless issued a valid permit, wood receipt, tag, and seal by the commissioner or sheriff, harvesting, transporting, selling, or possessing specific desert plants is prohibited.

Applicable LORS	Description
Local	
San Bernardino County General Plan: Conservation/Open Space Element of the County General Plan (County of San Bernardino 2007)	Includes objectives to preserve water quality and open space to benefit biological resources, and specific policies and goals for protecting areas of sensitive plant, soils and wildlife habitat and for assuring compatibility between natural areas and development. Although the Calico Solar Project is not located on lands under county jurisdiction, the general plan provides objectives which are consistent with some of the LORS listed above.

CULTURAL RESOURCES

Applicable LORS	Description
Federal	
National Historic Preservation Act of 1966, as amended, 16 USC 470(f)	Section 106 of the Act requires Federal agencies to take into account the effects of a proposed action on cultural resources (historic properties) and afford the Advisory Council on Historic Preservation the opportunity to comment.
36 CFR Part 800 (as amended August 5, 2004),	Implementing regulations of Section 106 of the National Historic Preservation Act
National Environmental Policy Act (NEPA): Title 42, USC, section 4321-et seq.	This statute requires Federal agencies to consider potential environmental impacts of projects with Federal involvement and to consider appropriate mitigation measures.
Federal Land Policy and Management Act (FLPMA): Title 43, USC, section 1701 et seq.	This statute requires the Secretary of the Interior to retain and maintain public lands in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric water resource, and archaeological values [Section 1701(a)(8)]; the Secretary, with respect to the public lands, shall promulgate rules and regulations to carry out the purposes of this Act and of other laws applicable to public lands [Section 1740].
Federal Guidelines for Historic Preservation Projects, Federal Register 44739-44738, 190 (September 30, 1983)	The Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by Federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The California Office of Historic Preservation refers to these standards in its requirements for selection of qualified personnel and in the mitigation of potential impacts to cultural resources on public lands in California.
Executive Order 11593 May 13, 1971 (36 Federal Register 8921)	This order mandates the protection and enhancement of the cultural environment through providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.
American Indian Religious Freedom Act; Title 42, USC, Section 1996	Protects Native American religious practices, ethnic heritage sites, and land uses.
Native American Graves Protection and Repatriation Act (1990); Title 25, USC Section 3001, et seq.,	The stature defines "cultural items," "sacred objects," and "objects of cultural patrimony;" establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for the return of specified cultural items.
U.S. Dept. of the Interior, Bureau of Land Management (BLM), the California Desert Conservation Area	1. Broaden the archaeological and historical knowledge of the CDCA through continuing efforts and the use of existing data. Continue the effort to identify the full array of the CDCA's cultural resources.
	2. Preserve and protect representative sample of the full array of the CDCA's cultural resources.

Applicable LORS	Description
(CDCA) Plan 1980 as amended – Cultural Resources Element Goals	3. Ensure that cultural resources are given full consideration in land use planning and management decisions, and ensure that BLM-authorized actions avoid inadvertent impacts.
	4. Ensure proper data recovery of significant (National Register of Historic Places-quality) cultural resources where adverse impacts can be avoided.
State	
California Environmental Quality Act (CEQA), Sections 21000 et seq. of the Public Resources Code (PRC) with Guidelines for implementation codified in the California Code of Regulations (CCR), Title 14, Chapter 3, Sections 15000 et seq.	CEQA requires that state and local public agencies to identify the environmental impacts of the proposed discretionary activities or projects, determine if the impacts will be significant, and identify alternatives and mitigation measures that will substantially reduce or eliminate significant impacts to the environment. Historical resources are considered a part of the environment and a project that may cause a substantial adverse effect on the significance of a historical resource is a project that may have a significant effect on the environment. The definition of “historical resources” is contained in Section 15064.5 of the CEQA Guidelines.
AB 4239, 1976	Established the Native American Heritage Commission (NAHC) as the primary government agency responsible for identifying and cataloging Native American cultural resources. The bill authorized the Commission to act in order to prevent damage to and insure Native American access to sacred sites and authorized the commission to prepare an inventory of Native American sacred sites located on public lands.
Public Resources Code 5097.97	No public agency, and no private party using or occupying public property, or operating on public property, under a public license, permit, grant, lease, or contract made on or after July 1, 1977, shall in any manner whatsoever interfere with the free expression or exercise of Native American religion as provided in the United States Constitution and the California Constitution; nor shall any such agency or party cause severe or irreparable damage to any Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property, except on a clear and convincing showing that the public interest and necessity so require.
Public Resources Code 5097.98 (b) and (e)	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until he/she confers with the Native American Heritage Commission-identified Most Likely Descendents (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to further disturbance.
California Health and Safety Code, Section 7050.5	This code makes it a misdemeanor to disturb or remove human remains found outside a cemetery. This code also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.

Applicable LORS	Description
Local	
County of San Bernardino 2007 General Plan, C. Countywide Goals and Policies of the Conservation Element	GOAL CO 1. The County will maintain to the greatest extent possible natural resources that contribute to the quality of life within the County. GOAL CO 3. The County will preserve and promote its historic and prehistoric cultural heritage. POLICIES CO 3.1 Identify and protect important archaeological and historic cultural resources in areas of the County that have been determined to have known cultural resource sensitivity. CO 3.2 Identify and protect important archaeological and historic cultural resources in all lands that involves disturbance of previously undisturbed ground. CO 3.3 Establish programs to preserve the information and heritage value of cultural and historical resources. CO 3.4 The County will comply with Government Code Section 65352.2 (SB18) by consulting with tribes as identified by the California Native American Heritage Commission on all General Plan and specific plan actions. CO 3.5 Ensure that important cultural resources are avoided or minimized to protect Native American beliefs and traditions.
County of San Bernardino 2007 Development Code	82.12.010 Purpose (a) Many of the resources are unique and non-renewable; and (b) The preservation of cultural resources provides a greater knowledge of County history, thus promoting County identity and conserving historic and scientific amenities for the benefit of future generations. 82.12.040 Development Standards Archaeological and historical resources determined by qualified professionals to be extremely important should be preserved as open space or dedicated to a public institution when possible.

FACILITY DESIGN

Applicable LORS	Description
Federal	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health standards
State	2007 California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations)
Local	San Bernardino County regulations and ordinances
General	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

GEOLOGY AND PALEONTOLOGY

Applicable LORS	Description
Federal	
Antiquities Act of 1906 (16 United States Code [USC], 431-433	The proposed Calico Solar Project is located entirely on federal (Bureau of Land Management) land. Although there is no specific mention of natural or paleontological resources in the Act itself, or in the Act's uniform rules and regulations (Title 43 Part 3, Code of Federal Regulations [43 CFR Part 3], 'objects of antiquity' has been interpreted to include fossils by the Federal Highways Act of 1956, the National Park Service (NPS), the Bureau of Land Management (BLM), the Forest Service (USFS), and other Federal agencies. All design will also need to adhere to any applicable BLM design standards.
Antiquities Act of 1906 (16 United States Code [USC], 431-433)	The proposed Calico Solar Project facility site is located entirely on land currently administered by the Bureau of Land Management (BLM). Although there is no specific mention of natural or paleontological resources in the Act itself, or in the Act's uniform rules and regulations (Title 43 Part 3, Code of Federal Regulations [43 CFR Part 3], 'objects of antiquity' has been interpreted to include fossils by the Federal Highways Act of 1956, the National Park Service (NPS), the BLM, the Forest Service (USFS), and other Federal agencies.
National Environmental Policy Act (NEPA) of 1970 (42 USC 4321, et. seq.)	Established the Council on Environmental Quality (CEQ), which is charged with preserving 'important historic, cultural, and natural aspects of our national heritage'.
Federal Land Policy and Management Act (FLPMA) of 1976 (43 USC 1701-1784)	Authorizes the BLM to manage public lands to protect the quality scientific, scenic, historical, archeological, and other values, and to develop 'regulations and plans for the protection of public land areas of critical environmental concern', which include 'important historic, cultural or scenic values'. Also charged with the protection of 'life and safety from natural hazards'.
Paleontological Resources Preservation Act (PRPA) (Public Law [PL] 111-011)	Authorizes Departments of Interior and Agriculture Secretaries to manage the protection of paleontological resources on Federal lands.
State	
California Building Code (CBC), 2007	The CBC (2007) includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control).
Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code (PRC), Section 2621–2630	Mitigates against surface fault rupture of known active faults beneath occupied structures. Requires disclosure to potential buyers of existing real estate and a 50-foot setback for new occupied buildings. Portions of the site and proposed ancillary facilities are located within designated Alquist-Priolo Fault Zones. The proposed site layout places occupied structures outside of the 50-foot setback zone.

Applicable LORS	Description
The Seismic Hazards Mapping Act, PRC Section 2690–2699	Areas are identified that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches.
PRC, Chapter 1.7, Sections 5097.5 and 30244	Regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.
Warren-Alquist Act, PRC, Sections 25527 and 25550.5(i)	The Warren-Alquist Act requires the Energy Commission to "give the greatest consideration to the need for protecting areas of critical environmental concern, including, but not limited to, unique and irreplaceable scientific, scenic, and educational wildlife habitats; unique historical, archaeological, and cultural sites…" With respect to paleontological resources, the Energy Commission relies on guidelines from the Society of Vertebrate Paleontology, indicated below.
California Environmental Quality Act (CEQA), PRC sections 15000 et seq., Appendix G	Mandates that public and private entities identify the potential impacts on the environment during proposed activities. Appendix G outlines the requirements for compliance with CEQA and provides a definition of significant impacts on a fossil site.
Society of Vertebrate Paleontology (SVP), 1995	The "Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures" is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. The measures were adopted in October 1995 by the SVP, a national organization of professional scientists.
Local	
San Bernardino County 2007 Development Code, Chapters 82.15, 82.20 and Safety Element	Chapter 82.15 requires that a geological study will be undertaken where roads and structures are to be constructed. Also requires that roads and utilities will be perpendicular to faults. Chapter 82.20 defines criteria for site evaluation for paleontological resources in the county, including preliminary field surveys, monitoring during construction, and specimen recovery; also defines qualifications for professional paleontologists. The Safety Element requires compliance with geological/geotechnical reports, the CBC, and other state agencies and regulations.

HAZARDOUS MATERIALS MANAGEMENT

Applicable LORS	Description
Federal	
The Superfund Amendments and Reauthorization Act of 1986 (42 USC §9601 et seq.)	Contains the Emergency Planning and Community Right To Know Act (also known as SARA Title III).
The Clean Air Act (CAA) of 1990 (42 USC 7401 et seq. as amended)	Establishes a nationwide emergency planning and response program, and imposes reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials.
The CAA Section on Risk Management Plans (42 USC §112(r)	Requires states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531, et seq.
49 CFR 172.800	Requires that the suppliers of hazardous materials prepare and implement security plans in accordance with U.S. Department of Transportation (DOT) regulations.
49 CFR Part 1572, Subparts A and B	Requires that suppliers of hazardous materials ensure that their hazardous material drivers comply with personnel background security checks.
The Clean Water Act (CWA) (40 CFR 112)	Aims to prevent the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Requires a written spill prevention, control, and countermeasures (SPCC) plan to be prepared for facilities that store oil that could leak into navigable waters.
Title 49, Code of Federal Regulations, Part 190	Outlines gas pipeline safety program procedures.
Title 49, Code of Federal Regulations, Part 191	Addresses the transportation of natural and other gases by pipeline. Requires preparation of annual reports, incident reports, and safety-related condition reports. Also requires operators of pipeline systems to notify the U.S. Department of Transportation DOT) of any reportable incident by telephone and submit a follow-up written report within 30 days.

Applicable LORS	Description
Title 49, Code of Federal Regulations, Part 192	Addresses transportation of natural and other gases by pipeline: Requires minimum federal safety standards, specifies minimum safety requirements for pipelines, and includes material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use that characterize the surrounding land. This part also contains regulations governing pipeline construction, which must be followed for Class 2 and Class 3 pipelines, and requirements for preparing a pipeline integrity management program.
6 CFR Part 27	The CFATS (Chemical Facility Anti-Terrorism Standard) regulation of the U.S. Department of Homeland Security (DHS) that requires facilities that use or store certain hazardous materials to submit information to the DHS so that a vulnerability assessment can be conducted to determine what certain specified security measures shall be implemented.
State	
California Health and Safety Code, section 25531 to 25543.4	The California Accidental Release Program (Cal-ARP) requires the preparation of a Risk Management Plan (RMP) and Off-site Consequence Analysis (OCA) and submittal to the local Certified Unified Program Agency (CUPA) for approval.
Title 8, California Code of Regulations, Section 5189	Requires facility owners to develop and implement effective safety management plans to ensure that large quantities of hazardous materials are handled safely. While these requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.
Title 8, California Code of Regulations, Section 5189	Sets forth requirements for design, construction, and operation of the vessels and equipment used to store and transfer ammonia. These sections generally codify the requirements of several industry codes including the American Society for Material Engineering (ASME) Pressure Vessel Code, the American National Standards Institute (ANSI) K61.1, and the National Boiler and Pressure Vessel Inspection Code. These codes apply to anhydrous ammonia but are also used to design storage facilities for aqueous ammonia.

Applicable LORS	Description
California Health and Safety Code, Section 41700	Requires that “No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”
California HSC Sections 25270 through 25270.13	Requires the preparation of a Spill Prevention, Control, and Countermeasures (SPCC) Plan if 10,000 gallons or more of petroleum is stored on-site. The above regulations would also require the immediate reporting of a spill or release of 42 gallons or more to the California Office of Emergency Services and the Certified Unified Program Agency (CUPA).
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)	Prevents certain chemicals that cause cancer and reproductive toxicity from being discharged into sources of drinking water.
Local	
2007 California Fire Code Title 24, Part 9	Adopts the California Fire Code, 2007 Edition, into San Bernardino County regulations.

LAND USE

Applicable LORS	Description
Federal	
Federal Land Policy and Management Act (FLPMA), 1976 – 43 CFR 1600	Establishes public land policy; guidelines for administration; and provides for the management, protection, development, and enhancement of public lands. In particular, the FLPMA's relevance to the proposed project is that Title V, Section 501 establishes BLM's authority to grant rights-of-way for generation, transmission, and distribution of electrical energy (FLPMA 2001).
Bureau of Land Management - California Desert Conservation Area (CDCA) Plan, 1980 as Amended (BLM 1980)	The 25 million-acre CDCA contains over 12 million acres of public lands spread within the area known as the California Desert, which includes the following three deserts: the Mojave, the Sonoran, and a small portion of the Great Basin. The 12 million acres of public lands administered by the BLM are half of the CDCA. The CDCA Plan is a comprehensive, long-range plan with goals and specific actions for the management, use, development, and protection of the resources and public lands within the CDCA, and it is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The plan's goals and actions for each resource are established in its 12 elements. Each of the plan elements provides both a desert-wide perspective of the planning decisions for one major resource or issue of public concern as well as a more specific interpretation of multiple-use class guidelines for a given resource and its associated activities.
Public Rangelands Improvement Act (1978) (PRIA 1978)	Establishes and reaffirms the national policy and commitment to inventory and identify current public rangeland conditions and trends; manage, maintain and improve the condition of public rangelands so that they become as productive as feasible for all rangeland values in accordance with management objectives and the land use planning process; and continue the policy of protecting wild free-roaming horses and burros from capture, branding, harassment, or death, while at the same time facilitating the removal and disposal of excess wild free-roaming horses and burros which pose a threat to themselves and their habitat and to other rangeland values.

Applicable LORS	Description
Wild and Free-Roaming Horse and Burro Act (1971) (BLM 2009j)	The BLM protects, manages, and controls wild horses and burros under the authority of the Wild Free-Roaming Horses and Burros Act of 1971 (Act) to ensure that healthy herds thrive on healthy rangelands. The BLM manages these animals as part of its multiple-use mission under the 1976 Federal Land Policy and Management Act. One of the BLM's key responsibilities under the Act is to determine the "appropriate management level" (AML) of wild horses and burros on the public rangelands.
State	
None	
Local	
None	

NOISE AND VIBRATION

Applicable LORS	Description
Federal (OSHA): 29 U.S.C. § 651 et seq.	Protects workers from the effects of occupational noise exposure.
State (Cal/OSHA): Cal. Code Regs., tit. 8, §§ 5095–5099	Protects workers from the effects of occupational noise exposure.
Local San Bernardino County General Plan Noise Element San Bernardino County Development Code, Ch. 83.01	 Establishes noise limits as specified in the Development Code (below) Establishes property line noise limits for various receiving uses. Exempts construction noise during certain hours. Establishes vibration limits.

POWER PLANT EFFICIENCY

No federal, state, local, or county laws, ordinances, regulations and standards (LORS) apply to the efficiency of this project.

POWER PLANT RELIABILITY

No federal, state, local, or county laws, ordinances, regulations and standards (LORS) pertain to the reliability of this project.

PUBLIC HEALTH

Applicable LORS	Description
Federal	
Clean Air Act section 112 (Title 42, U.S. Code section 7412)	This act requires new sources that emit more than 10 tons per year of any specified Hazardous Air Pollutant (HAP) or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology.
State	
California Health and Safety Code section 25249.5 et seq. (Proposition 65)	These sections establish thresholds of exposure to carcinogenic substances above which Prop 65 exposure warnings are required.
California Health and Safety Code section 41700	This section states that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”
California Public Resource Code section 25523(a); Title 20 California Code of Regulations (CCR) section 1752.5, 2300–2309 and Division 2 Chapter 5, Article 1, Appendix B, Part (1); California Clean Air Act, Health and Safety Code section 39650, et seq.	These regulations require a quantitative health risk assessment for new or modified sources, including power plants that emit one or more toxic air contaminants (TACs).
Local	
Mojave Desert Air Quality Management District (MDAQMD) Rule 1302	New Source Review for Toxic Air Contaminants.

SOCIOECONOMICS

Applicable LORS	Description
Federal	
Emergency Economic Stabilization Act of 2008 (P.L. 110-343) Business Solar Investment Tax Credit (IR Code	Extends the 30% investment tax credit (ITC) for solar energy property for eight years through December 31, 2016. The bill allows the ITC to be used to offset both regular and alternative minimum tax (AMT) and waives the public utility exception of current law (i.e., permits utilities to directly invest in solar facilities and claim the ITC). The five-year accelerated depreciation allowance for solar property is permanent and unaffected by passage of the eight-year extension of the solar ITC.
State	
California Education Code, Section 17620	The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.
California Government Code, Sections 65996-65997	Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code**,** state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.
California Revenue and Taxation Code Section 70-74.7	Property taxes are not assessed on solar facilities. Assembly Bill 1451 extended the current property tax exclusion for new construction of solar energy systems to January 1, 2017.

SOIL & WATER RESOURCES

Applicable LORS	Description
Federal	
Clean Water Act (33 U.S.C. Section 1257 et seq.)	The Clean Water Act (CWA) (33 USC § 1257 et seq.) requires states to set standards to protect water quality, which includes regulation of storm water and wastewater discharges during construction and operation of a facility. California established its regulations to comply with the CWA under the Porter-Cologne Water Quality Control Act of 1967. The CWA also establishes protection of navigable waters through Section 401 and 404. Section 404 permitting and. Section 401 certification through the Army Corps of Engineers and Regional Water Quality Control Board (RWQCB) is required if there are potential impacts to surface waters of the State and/or Waters of the United States, such as perennial and ephemeral drainages, streams, washes, ponds, pools, and wetlands. The Army Corps and RWQCB can require impacts to these waters to be quantified and mitigated.
Resource Conservation and Recovery Act, 40 CFR Part 260 et seq.	The Resource Conservation Recovery Act (RCRA) is a comprehensive body of regulations that give U.S. EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also sets forth a framework for the management of non-hazardous solid wastes.
State	
California Constitution, Article X, Section 2	This section requires that the water resources of the State be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use of water is prohibited.
The Porter-Cologne Water Quality Control Act of 1967, Water Code Sec 13000 et seq.	Requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. Those regulations require that the RWQCBs issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable. Section 13000 also states that the State must be prepared to exercise its full power and jurisdiction to protect the quality of the waters of the State from degradation.
California Water Code Section 13050	Defines “waters of the State.”
California Water Code Section 13240, 13241, 13242, 13243, & Water Quality Control Plan for the Lahontan Region (Basin Plan)	The Basin Plan establishes water quality objectives that protect the beneficial uses of surface water and groundwater in the Region. The Basin Plan describes implementation plans and other control measures designed to ensure compliance with statewide plans and policies and provides comprehensive water quality planning. The following chapters are applicable to determining appropriate control measures and cleanup levels to protect beneficial uses and to meet the water quality objectives: Chapter 2, Present and Potential Beneficial Uses; Chapter 3, Water Quality Objectives, and the sections of Chapter 4, Implementation, entitled “Requirements for Site Investigation and Remediation,” “Cleanup Levels,” “Risk Assessment,” “Stormwater Problems and Control Measures,” Erosion and Sedimentation,” “Solid and Liquid Waste Disposal to Land,” and “Groundwater Protection and Management.”

Applicable LORS	Description
California Water Code Section 13260	Requires filing, with the appropriate RWQCB, a report of waste discharge that could affect the water quality of the state unless the requirement is waived pursuant to Water Code section 13269.
California Code of Regulations, Title 23, Division 3, Chapter 30	This chapter requires the submission of analytical test results and other monitoring information electronically over the internet to the SWRCB's Geotracker database.
State Water Resources Control Board General Permit CAS000002.	The SWRCB regulates storm water discharges associated with construction projects affecting areas greater than or equal to 1 acre to protect state waters. Under General Permit CAS000002, the SWRCB has issued a National Pollutant Discharge Elimination System (NPDES) General Permit for storm water discharges associated with construction activity. Projects can qualify under this permit if specific criteria are met and an acceptable Storm Water Pollution Prevention Plan (SWPPP) is prepared and implemented after notifying the SWRCB with a Notice of Intent.
State Water Resources Control Board 2003-003-DWQ	This general permit applies to the discharge of water to land that has a low threat to water quality. Categories of low threat discharges include piping hydrostatic test water.
California Code of Regulations, Title 22	Title 22, Division 4, Chapter 15 specifies Primary and Secondary Drinking Water Standards in terms of Maximum Contaminant Levels (MCLs). These MCLs include total dissolved solids (TDS) ranging from a recommended level of 500 milligrams per liter (mg/l), an upper level of 1,000 mg/l and a short term level of 1,500 mg/l. Other water quality MCLs are also specified, in addition to MCLS specified for heavy metals and chemical compounds.
California Code of Regulations, Title 23	Title 23, Division 3, Chapter 15 applies to waste discharges to land and requires the Regional Board issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.
Local	
County of San Bernardino General Plan and Development Code	Grading in San Bernardino County is subject to terms and conditions of San Bernardino County's General Plan, Development Code and California Building Code, based upon the 2006 International Building Code. Although the proposed site is located on federal land, county regulations for public health and safety are considered to be applicable to the project. If a county grading permit is required, the grading plan would need to be completed in compliance with San Bernardino County's General Plan and Development Code.

Applicable LORS	Description
California Safe Drinking Water Act and San Bernardino County Code Title 3, Division 3, Chapter 6, Public Water Supply Systems	Requires public water systems to obtain a Domestic Water Supply Permit. The California Safe Drinking Water Act requires public water systems to obtain a Domestic Water Supply Permit. Public water systems are defined as a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out the year. California Department of Public Health (CDPH) administers the Domestic Water Supply Permit program, and has delegated issuance of Domestic Water Supply Permits for smaller public water systems in San Bernardino County to the County. Under the San Bernardino County Code Title 3, 5.15-6 Division 3, Chapter 6, Public Water Supply Systems, the County Department of Environmental Services monitors and enforces all applicable laws and orders for public water systems with less than 200 service connections. The proposed project would likely be considered a non-transient, non-community water system.
San Bernardino County Title 3, Division 3, Chapter 6,Article 5, Desert Groundwater Management	To help protect water resources in unregulated portions of the desert while not precluding its use, the County adopted this article. This article requires a permit to locate, construct, operate, or maintain a new groundwater well within the unincorporated, unadjudicated desert region of San Bernardino County. California Environmental Quality Act (CEQA) compliance must be completed prior to issuance of a permit, and groundwater management, mitigation, and monitoring may be required as a condition of the permit. The ordinance states that it does not apply to “groundwater wells located on Federal lands unless otherwise specified by inter-agency agreement.” The BLM and County entered into a Memorandum of understanding (MOU) that provides that the BLM will require conformance with this code for all projects proposing to use groundwater from beneath public lands.
San Bernardino County Development Code Section 82.13.080, Soil Erosion and Sediment Control Plans/Permits	Section 82.13.080 establishes regulations and procedures to control human existing and potential induced accelerated erosion. Elements of this ordinance include project planning, preparation of Soil Erosion and Sediment Control Plans, runoff control, land clearing, and winter operations.
San Bernardino County Municipal Stormwater Permit	The current Permit, Order No. R8-2010-0036 adopted January 29, 2010,, outlines a schedule of monitoring requirements, best management practices, and conditions designed to promote the reduction of pollutants in stormwater discharges.
San Bernardino County Ordinance Code, Title 3, Division 3, Chapter 8, Waste Management, Article 5, Liquid Waste Disposal	This ordinance requires the following compliance for all liquid waste disposal systems: (1) compliance with applicable portions of the Uniform Plumbing Code and the San Bernardino County Department of Environmental Health (DEHS) standards; (2) approval by the DEHS and building authority with jurisdiction over the system; or (3) for alternative systems, approval by the DEHS, the appropriate building official of this jurisdiction, and the appropriate California RWQCB.
San Bernardino County Ordinance Code, Title 6, Division 3, Chapter 3, Uniform Plumbing Code	This ordinance describes the installation and inspection requirements for locating disposal/leach fields and seepage pits.

Applicable LORS	Description
State Policies and Guidance	
Integrated Energy Policy Report (Public Resources Code, Div. 15, Section 25300 et seq.)	In the 2003 Integrated Energy Policy Report (IEPR), consistent with SWRCB Policy 75-58 and the Warren-Alquist Act, the Energy Commission adopted a policy stating they will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound."
State Water Resources Control Board Res. No. 68-16	The "Antidegradation Policy" mandates that: 1) existing high quality waters of the State are maintained until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonable affect present and anticipated beneficial uses, and will not result in waste quality less than adopted policies; and 2) requires that any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters, must meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that: a) a pollution or nuisance will not occur and b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.
State Water Resources Control Board Res. 75-58	The principal policy of the SWRCB that addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (adopted by the Board on June 19, 1976, by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound.
State Water Resources Control Board Res. No. 88-63	States that all groundwater and surface water of the State are considered to be suitable for municipal or domestic water supply with the exception of those waters that meet specified conditions.
State Water Resources Control Board Res. 2005-0006	Adopts the concept of sustainability as a core value for State Water Board programs and directs its incorporation in all future policies, guidelines, and regulatory actions.
State Water Resources Control Board Res. 2008-0030	Requires sustainable water resources management such as low impact development (LID) and climate change considerations, in all future policies, guidelines, and regulatory actions. Directs Regional Water Boards to "aggressively promote measures such as recycled water, conservation and LID Best Management Practices where appropriate and work with Dischargers to ensure proposed compliance documents include appropriate, sustainable water management strategies."
The California Safe Drinking Water and Toxic Enforcement Act	The California Health & Safety Code Section 25249.5 et seq. prohibits actions contaminating drinking water with chemicals known to cause cancer or possessing reproductive toxicity. The RWQCB administers the requirements of the Act.

TRAFFIC AND TRANSPORTATION

Applicable LORS	Description
Federal	
Code of Federal Regulations (CFR), Title 14, Aeronautics and Space; Part 77, Objects Affecting Navigable Airspace (14 CFR 77)	Includes standards for determining physical obstructions to navigable airspace; information about requirements for notices, hearings, and requirements for aeronautical studies to determine the effect of physical obstructions to the safe and efficient use of airspace.
*Code of Federal Regulations (*CFR*)*, Title 49, Subtitle B, Sections 171-177; Sections 350-399; Appendices A-G Other Regulations Relating to Transportation	Includes procedures and regulations pertaining to interstate and intrastate transport (including hazardous materials program procedures) and as well as safety measures for motor carriers and motor vehicles operating on public highways.
State	
California Vehicle Code (CVC), Division 2, Chapter 2.5, Div. 6; Chap. 7, Div. 13; Chap. 5, Div. 14.1; Chap. 1 and 2, Div. 14.8, Div. 15	Pertain to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and transporting hazardous materials.
California Streets and Highway Code, Section 117; Section 660-695; Section 700-711; Section 1450; 1460 et seq.; and 1480 et. Seq.	Pertain to regulating rights-of-way encroachments and granting permits for encroachment on state highways and freeways and on county roads.
California Health and Safety Code; Section 25160 et seq.	Pertain to operators of vehicles transporting hazardous materials
Local	
San Bernardino General Plan, Circulation and Infrastructure Element, Desert Region	Pertains to public policies and strategies for the transportation system in San Bernardino County, including those pertaining to transportation routes, terminals, and facilities; construction of extensions of existing streets; and levels of services (LOS).
San Bernardino Traffic Code, Section 52.0125	Pertains to requirements for oversize and overweight vehicles.

TRANSMISSION LINE SAFETY AND NUISANCE

Applicable LORS	Description
Aviation Safety	
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR),"Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1G, "Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/460-1G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
Interference with Radio Frequency Communication	
Federal	
Title 47, CFR, section 15.2524, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
State	
California Public Utilities Commission (CPUC) General Order 52 (GO-52)	Governs the construction and operation of power and communications lines to prevent or mitigate interference.
Audible Noise	
Local	
San Bernardino County General Plan, Noise Element	References the county's Ordinance Code for noise limits.
San Bernardino County Noise Ordinance	Establishes performance standards for planned residential or other noise-sensitive land uses.
Hazardous and Nuisance Shocks	
State	
CPUC GO-95, "Rules for Overhead Electric Line Construction"	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.
Title 8, California Code of Regulations (CCR) section 2700 et seq. "High Voltage Safety Orders"	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.

Applicable LORS	Description
National Electrical Safety Code	Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.
Industry Standards	
Institute of Electrical and Electronics Engineers (IEEE) 1119, “IEEE Guide for Fence Safety Clearances in Electric-Supply Stations”	Specifies the guidelines for grounding-related practices within the right-of-way and substations.
Electric and Magnetic Fields	
State	
GO-131-D, CPUC ”Rules for Planning and Construction of Electric Generation Line and Substation Facilities in California”	Specifies application and noticing requirements for new line construction including EMF reduction.
CPUC Decision 93-11-013	Specifies CPUC requirements for reducing power frequency electric and magnetic fields.
Industry Standards	
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines	Specifies standard procedures for measuring electric and magnetic fields from an operating electric line.
Fire Hazards	
State	
14 CCR sections 1250-1258, “Fire Prevention Standards for Electric Utilities”	Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

TRANSMISSION SYSTEM ENGINEERING

Applicable LORS	Description
The North American Electric Reliability Corporation (NERC)	North American Reliability Council (NERC) Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC Standards are either more stringent or more specific than the NERC Standards for Transmission System Contingency Performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC 2006).
Western Electricity Coordinating Council's (WECC)	The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Council (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on Section I.A of the standards, "NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table" and on Section I.D, "NERC and WECC Standards for Voltage Support and Reactive Power". These standards require that the results of power

	flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WECC 2006).
California Public Utilities Commission (CPUC) General Order 95 (GO-95*), Rules for Overhead Electric Line Construction*	Specifies uniform requirements for the construction of overhead electric lines. Compliance with this order ensures both reliable service and a safe working environment for those working in the construction, maintenance, operation, or use of overhead electric lines, and for the safety of the general public.
CPUC General Order 128 (GO-128), *Rules for Underground Electric Line Construction*	Establishes uniform requirements for the construction of underground electric lines. Compliance with this order also ensures both reliable service and a safe working environment for those working in the construction, maintenance, operation, or use of underground electric lines, and for the safety of the general public.
National Electric Safety Code 1999	Provides electrical, mechanical, civil, and structural requirements for overhead electric line construction and operation.
California Independent System Operator (CAISO)	California ISO Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the California ISO transmission grid facilities. The California ISO Grid Planning Standards incorporate the NERC/WECC and NERC Reliability Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar

	to the NERC/WECC or NERC Reliability Planning Standards for Transmission System Contingency Performance. However, the California ISO Standards also provide some additional requirements that are not found in the WECC/NERC or NERC Standards. The California ISO Standards apply to all participating transmission owners interconnecting to the California ISO controlled grid. They also apply when there are any impacts to the California ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the California ISO (California ISO 2002a). California ISO/FERC Electric Tariff provides guidelines for construction of all transmission additions/upgrades (projects) within the California ISO controlled grid. The California ISO determines the “Need” for the proposed project where it will promote economic efficiency or maintain system reliability. The California ISO also determines the Cost Responsibility of the proposed project and provides an Operational Review of all facilities that are to be connected to the California ISO grid (California ISO 2007a).

VISUAL RESOURCES

Applicable LORS	Definition
Federal	
National Environmental Policy Act (NEPA)	As discussed above, applicable federal requirements for visual impact assessment are enacted through application of the BLM VRM methodology, discussed below.
Federal Land Policy and Management Act of 1976 (FLPMA)	Section 102 (a) of the Federal Land Policy and Management Act of 1976 (FLPMA) states that " . . . the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values …. " Section 103 (c) identifies "scenic values" as one of the resources for which public land should be managed. Section 201 (a) states that "The Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including ... scenic values) ...." Section 505 (a) requires that "Each right-of-way shall contain terms and conditions which will... minimize damage to the scenic and esthetic values...."
California Desert Conservation Area Plan (CDCA Plan)	The CDCA Plan represents the Resource Management Plan (RMP) for the area required under FLPMA. The CDCA Plan did not contain VRM mapping as in most RMPs. The Calico site is classified in the CDCA Plan as Multiple-Use Class (MUC) M (Moderate Use). MUC M lands are managed to provide a wider variety of uses such as mining, grazing, recreation, utilities, and energy development, while conserving desert resources and mitigating damages permitted uses may cause. Under the CDCA Plan Electrical Power Generation Facilities, including Wind/Solar facilities, may be allowed within MUC Class M if NEPA requirements are met.
National Historic Preservation Act (NHPA)	Under regulations of the NHPA, visual impacts to a listed or eligible National Register property that may diminish the integrity of the property's ". . . setting . . .(or) feeling . . . ." in a way that affects the property's eligibility for listing, may result in a potentially significant adverse effect. "Examples of adverse effects . . . include . . .:

Applicable LORS	Definition
	Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features . . . . " (36 CFR Part 800.5)
State	
State Scenic Highway Program (CA. Streets and Highways Code, Section 260 et seq.)	The State Scenic Highway Program promotes protection of designated State scenic highways through certification and adoption of local scenic corridor protection programs that conform to requirements of the State program.
Local	
San Bernardino County General Plan (2007) Applicable Conservation Element Goals, Objectives, Programs	***CONSERVATION ELEMENT*** *GOAL CO 1*. The County will maintain to the greatest extent possible natural resources that contribute to the quality of life within the County. Policy CO 1.2 The preservation of some natural resources requires the establishment of a buffer area between the resource and developed areas. The County will continue the review of the Land Use Designations for unincorporated areas within one mile of any state or federally designated scenic area, national forest, national monument, or similar area, to ensure that sufficiently low development densities and building controls are applied to protect the visual and natural qualities of these areas. Policy CO 8.1 Maximize the beneficial effects and minimize the adverse effects associated with the siting of major energy facilities. The County will site energy facilities equitably in order to minimize net energy use and consumption of natural resources, and avoid inappropriately burdening certain communities. Energy planning should conserve energy and reduce peak load demands, reduce natural resource consumption, minimize environmental impacts, and treat local communities fairly. The County will consult with electric utilities during the construction of their major transmission line towers to ensure that they are aesthetically compatible with the surrounding environment.

Applicable LORS	Definition
San Bernardino County General Plan (2007) Applicable Conservation Element Goals, Objectives, Programs (continued)	The County shall consult with electric utilities during the planning construction of their major transmission lines towers to ensure that they are aesthetically compatible with the surrounding environment. ***OPEN SPACE ELEMENT*** *GOAL OS 4.* The County will preserve and protect cultural resources throughout the County, including parks, areas of regional significance, and scenic, cultural and historic sites that contribute to a distinctive visual experience *GOAL OS 5*. The County will maintain and enhance the visual character of scenic routes in the County. Scenic Route: Interstate 40 from Ludlow northeast to Needles. (p. 223) ***LAND USE ELEMENT*** GOAL D/LU 1. Maintain land use patterns in the Desert Region that enhance the rural environment and preserve the quality of life of the residents of the region. ***CONSERVATION ELEMENT*** GOAL D/CO 3. Preserve the dark night sky as a natural resource in the Desert Region communities. POLICIES D/CO 3.1 Protect the Night Sky by providing information about and enforcing existing ordinances: a. Provide information about the Night Sky ordinance and lighting restrictions with each land use or building permit application. b. Review exterior lighting as part of the design review process. D/CO 3.2 All outdoor lighting, including street lighting, shall be provided in accordance with the Night Sky Protection Ordinance and shall only be provided as necessary to meet safety standards. D/CO 3.3 Allow for desert communities' input on the need for, and placement of, new street lights.

Applicable LORS	Definition
San Bernardino County General Plan (2007) Applicable Conservation Element Goals, Objectives, Programs (continued)	
San Bernardino Development Code Chapter 83.07.040 Glare and Outdoor Lighting - Mountain and Desert Regions.	Sets various standards and conditions for external lighting in residential and commercial situations. Exempts facilities on Federal Property

WASTE MANAGEMENT

Applicable LORS	Description
Federal	
Title 42, United States Code (U.S.C.), §6901, et seq. Solid Waste Disposal Act of 1965 (as amended and revised by the Resource Conservation and Recovery Act of 1976, et al.)	The Solid Waste Disposal Act, as amended and revised by the Resource Conservation and Recovery Act (RCRA) et al., establishes requirements for the management of solid wastes (including hazardous wastes), landfills, underground storage tanks, and certain medical wastes. The statute also addresses program administration, implementation and delegation to states, enforcement provisions, and responsibilities, as well as research, training, and grant funding provisions. RCRA Subtitle C establishes provisions for the generation, storage, treatment, and disposal of hazardous waste, including requirements addressing: • Generator record keeping practices that identify quantities of hazardous wastes generated and their disposition; • Waste labeling practices and use of appropriate containers; • Use of a manifest when transporting wastes; • Submission of periodic reports to the United States Environmental Protection Agency (U.S. EPA) or other authorized agency; and • Corrective action to remediate releases of hazardous waste and contamination associated with RCRA-regulated facilities. RCRA Subtitle D establishes provisions for the design and operation of solid waste landfills. RCRA is administered at the federal level by U.S. EPA and its 10 regional offices. The Pacific Southwest regional office (Region 9) implements U.S. EPA programs in California, Nevada, Arizona, and Hawaii.

Applicable LORS	Description
Title 42, U.S.C., §9601, et seq. Comprehensive Environmental Response, Compensation and Liability Act	The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as *Superfund*, establishes authority and funding mechanisms for cleanup of uncontrolled or abandoned hazardous waste sites, as well as cleanup of accidents, spills, or emergency releases of pollutants and contaminants into the environment. Among other things, the statute addresses: • Reporting requirements for releases of hazardous substances; • Requirements for remedial action at closed or abandoned hazardous waste sites, and brownfields; • Liability of persons responsible for releases of hazardous substances or waste; and • Requirements for property owners/potential buyers to conduct "all appropriate inquiries" into previous ownership and uses of the property to 1) determine if hazardous substances have been or may have been released at the site, and 2) establish that the owner/buyer did not cause or contribute to the release. A Phase I Environmental Site Assessment is commonly used to satisfy CERCLA "all appropriate inquiries" requirements.
Title 40, Code of Federal Regulations (CFR), Subchapter I – Solid Wastes	These regulations were established by U.S. EPA to implement the provisions of the Solid Waste Disposal Act and RCRA (described above). Among other things, the regulations establish the criteria for classification of solid waste disposal facilities (landfills), hazardous waste characteristic criteria and regulatory thresholds, hazardous waste generator requirements, and requirements for management of used oil and universal wastes. • Part 257 addresses the criteria for classification of solid waste disposal facilities and practices. • Part 258 addresses the criteria for municipal solid waste landfills. • Parts 260 through 279 address management of hazardous wastes, used oil, and universal wastes (i.e., batteries, mercury-containing equipment, and lamps). U.S. EPA implements the regulations at the federal level. However, California is an RCRA-authorized state, so most of the solid and hazardous waste regulations are implemented by state agencies and authorized local agencies in lieu of U.S. EPA.
Title 49, CFR, Parts 172 and 173. Hazardous Materials Regulations	These regulations address the United States Department of Transportation (DOT) established standards for transport of hazardous materials and hazardous wastes. The standards include requirements for labeling, packaging, and shipping of hazardous materials and hazardous wastes, as well as training requirements for personnel completing shipping papers and manifests. Section 172.205 specifically addresses use and preparation of hazardous waste manifests in accordance with Title 40, CFR, section 262.20.

Applicable LORS	Description
Federal CWA, 33 USC § 1251 *et seq.*	The Clean Water Act controls discharge of wastewater to the surface waters of the U.S.
Title 40 CFR Section 112	This establishes procedures, methods, equipment, and other requirements to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable waters of the United States or adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974. Subpart B - The Spill Prevention, Control and Countermeasures (SPCC) Plan includes procedures, methods, and equipment at the facility to prevent discharges of petroleum from reaching navigable waters.
State	
California Health and Safety Code (HSC), Chapter 6.5, §25100, et seq. Hazardous Waste Control Act of 1972, as amended	This California law creates the framework under which hazardous wastes must be managed in California. The law provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA program. It also provides for the designation of California-only hazardous wastes and development of standards (regulations) that are equal to or, in some cases, more stringent than federal requirements. The California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) administers and implements the provisions of the law at the state level. Certified Unified Program Agencies (CUPAs) implement some elements of the law at the local level.
Title 22, California Code of Regulations (CCR), Division 4.5. Environmental Health Standards for the Management of Hazardous Waste	These regulations establish requirements for the management and disposal of hazardous waste in accordance with the provisions of the California Hazardous Waste Control Act and federal RCRA. As with the federal requirements, waste generators must determine if their wastes are hazardous according to specified characteristics or lists of wastes. Hazardous waste generators must obtain identification numbers; prepare manifests before transporting the waste off site; and use only permitted treatment, storage, and disposal facilities. Generator standards also include requirements for record keeping, reporting, packaging, and labeling. Additionally, while not a federal requirement, California requires that hazardous waste be transported by registered hazardous waste transporters. The standards addressed by Title 22, CCR include: • Identification and Listing of Hazardous Waste (Chapter 11, §66261.1, et seq.). • Standards Applicable to Generator of Hazardous Waste (Chapter 12, §66262.10, et seq.). • Standards Applicable to Transporters of Hazardous Waste (Chapter 13, §66263.10, et seq.). • Standards for Universal Waste Management (Chapter 23, §66273.1, et seq.).

Applicable LORS	Description
	• Standards for the Management of Used Oil (Chapter 29, §66279.1, et seq.). • Requirements for Units and Facilities Deemed to Have a Permit by Rule (Chapter 45, §67450.1, et seq.). The Title 22 regulations are established and enforced at the state level by DTSC. Some generator and waste treatment standards are also enforced at the local level by CUPAs.
HSC, Chapter 6.11 §§25404 – 25404.9 Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)	The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of the six environmental and emergency response programs listed below. • Aboveground Petroleum Storage Act requirements for Spill Prevention, Control, and Countermeasure (SPCC) Plans. • Hazardous Materials Release and Response Plans and Inventories (Business Plans). • California Accidental Release Prevention (CalARP) Program. • Hazardous Materials Management Plan / Hazardous Materials Inventory Statements. • Hazardous Waste Generator / Tiered Permitting Program. • Underground Storage Tank Program. The state agencies responsible for these programs set the standards for their programs while local governments implement the standards. The local agencies implementing the Unified Program are known as CUPAs. The DTSC's Calexico Field Office is the CUPA for the Calico Solar Project. Note: The Waste Management analysis only considers application of the Hazardous Waste Generator/Tiered Permitting element of the Unified Program.
Title 27, CCR, Division 1, Subdivision 4, Chapter 1, §15100, et seq. Unified Hazardous Waste and Hazardous Materials Management Regulatory Program	While these regulations primarily address certification and implementation of the program by the local CUPAs, the regulations do contain specific reporting requirements for businesses. • Article 9 – Unified Program Standardized Forms and Formats (§§ 15400–15410). • Article 10 – Business Reporting to CUPAs (§§15600–15620).
Public Resources Code, Division 30, §40000, et seq. California Integrated Waste Management Act of 1989	The California Integrated Waste Management Act (CIWMA) establishes mandates and standards for management of solid waste in California. The law addresses solid waste landfill diversion requirements; establishes the preferred waste management hierarchy (source reduction first, then recycling and reuse, and treatment and disposal last); sets standards for design and

Applicable LORS	Description
	construction of municipal landfills; and addresses programs for county waste management plans and local implementation of solid waste requirements.
Title 14, CCR, Division 7, §17200, et seq. California Integrated Waste Management Board	These regulations implement the provisions of the California Integrated Waste Management Act and set forth minimum standards for solid waste handling and disposal. The regulations include standards for solid waste management, as well as enforcement and program administration provisions. • Chapter 3 – Minimum Standards for Solid Waste Handling and Disposal. • Chapter 3.5 – Standards for Handling and Disposal of Asbestos Containing Waste. • Chapter 7 – Special Waste Standards. • Chapter 8 – Used Oil Recycling Program. • Chapter 8.2 – Electronic Waste Recovery and Recycling.
HSC, Division 20, Chapter 6.5, Article 11.9, §25244.12, et seq. Hazardous Waste Source Reduction and Management Review Act of 1989	This law was enacted to expand the state's hazardous waste source reduction activities. Among other things, it establishes hazardous waste source reduction review, planning, and reporting requirements for businesses that routinely generate more than 12,000 kilograms (approximately 26,400 pounds) of hazardous waste in a designated reporting year. The review and planning elements are required to be done on a 4-year cycle, with a summary progress report due to DTSC every fourth year.
Title 22, CCR, §67100.1 et seq. Hazardous Waste Source Reduction and Management Review	These regulations further clarify and implement the provisions of the Hazardous Waste Source Reduction and Management Review Act of 1989 (noted above). The regulations establish the specific review elements and reporting requirements to be completed by generators subject to the act.
Title 23, CCR Division 3, Chapters 16 and 18	These regulations relate to hazardous material storage and petroleum UST cleanup, as well as hazardous waste generator permitting, handling, and storage. The DTSC San Bernardino County CUPA is responsible for local enforcement.
Local	
County of San Bernardino General Plan	The General Plan ensures all new development complies with applicable provisions of the County Integrated Solid Waste Management Plan.
San Bernardino County, Countywide Integrated Waste Management Plan	This document sets forth the county's goals, policies, and programs for reducing dependence on landfilling solid wastes and increasing source reduction, recycling, and reuse of products and waste, in compliance with the CIWMA. The plan also addresses the siting and development of recycling and disposal facilities and programs within the county.

WORKER SAFETY AND FIRE PROTECTION

Applicable LORS	Description
Federal	
29 U.S. Code sections 651 et seq. (Occupational Safety and Health Act of 1970)	This Act mandates safety requirements in the workplace, with the purpose of "[assuring] so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources" (29 USC § 651).
29 CFR sections 1910.1 to 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations)	These sections define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector.
29 CFR sections 1952.170 to 1952.175	These sections provide federal approval of California's plan for enforcement of its own safety and health requirements, in lieu of most of the federal requirements found in 29 CFR §1910.1 to 1910.1500.
State	
2007 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9)	NFPA standards are incorporated into the California State Fire Code. The fire code contains general provisions for fire safety, including road and building access, water supplies, fire protection and life safety systems, fire-resistive construction, storage of combustible materials, exits and emergency escapes, and fire alarm systems.
Title 24, California Code of Regulations (24 CCR § 3, et seq.)	The California Building Code is comprised of 11 parts containing building design and construction requirements as they relate to fire, life, and structural safety. It incorporates current editions of the International Building Code, including the electrical, mechanical, energy, and fire codes applicable to the project.
8 CCR all applicable sections (Cal/OSHA regulations)	Requires that all employers follow these regulations as they pertain to the work involved. This includes regulations pertaining to safety matters during the construction, commissioning, and operation of power plants, as well as safety around electrical components, fire safety, and hazardous materials usage, storage, and handling.
24 CCR section 3, et seq.	Incorporates the current edition of the International Building Code.
Health and Safety Code sections 25500 to 25541	Requires a Hazardous Materials Business plan detailing emergency response plans for hazardous materials emergencies at a facility.

Applicable LORS	Description
Local (or locally enforced)	
Fire and Hazardous Materials: San Bernardino County Code, Title 2, Division 3, Chapter 1 et seq.	Includes California Fire Code and specific codes to regulate permits activities and administrative penalties. Adopts the 2007 California Fire Code and adopts State requirements and guidelines as governing hazardous materials release response plans and inventories.
Health and Safety: San Bernardino County Code Title 3, Division 1, et seq.	Includes specific codes to regulate permits, activities (e.g., solid waste management), and administrative penalties.
Building and Construction: San Bernardino County Code, Title 6, Division 3, Chapter 1 et seq.	Adopts national standards such as Uniform Building Code and National Electrical Code.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

Docket Number: ***08-AFC-13*** Date: August 25, 2010

Project Name: **Application for Certification for the *CALICO SOLAR Project***

DRAFT EXHIBIT LIST

Applicant's Exhibits

Exhibit	Brief Description	Offered	Admitted
1.	Application for Certification, dated December 1, 2008, docketed December 2, 2008		
a.	1.0 Executive Summary		
b.	2.0 Project Objectives/Need		
c.	App A MOU		
d.	App C Property Owners		
e.	App D Burlington Northern Santa Fe Railroad ROW		
f.	3.0 Project Description and Location		
g.	App B Solar Stirling Engine		
h.	App F Mechanical and Fire Protection Design Criteria		
i.	App G USGS Project Maps		
j.	App H System Impact Study		
k.	App I Electric and Magnetic Field calculations		
l.	App J Water Balance Flow Diagrams		
m.	App K Hydrogen System Design		
n.	App L Hazardous Materials Handling		
o.	App M Structural Engineering Design Criteria		
p.	App N Initial Drainage Report		
q.	App O Civil Engineering Design Criteria		
r.	App P Electrical Engineering Criteria		
s.	App Q Control Systems Design Criteria		
t.	App R Fuel handling Design Criteria		

Exhibit	Brief Description	Offered	Admitted
u.	App S Materials Safety/Equipment		
v.	App T Phase I Environmental Site Assessment		
w.	App EE Environmental Summary Lugo-Pisgah		
x.	4.0 Alternatives		
y.	5.1 Introduction		
z.	5.2 Air Quality		
aa.	App V – Air Quality Data		
bb.	5.3 Geologic Hazards		
cc.	App E Preliminary Geotechnical and Geologic Hazards Evaluation		
dd.	5.4 Soils		
ee.	App W Soil loss calculations		
ff.	5.5 Water Resources		
gg.	5.6 Biological Resources		
hh.	App Y – Biological Technical Report		
ii.	5.7 Cultural Resources		
jj.	App Z Cultural Tech Report		
kk.	5.8 Paleontological Resources		
ll.	App AA Paleontological Resources Tech Report		
mm.	5.9 Land Use		
nn.	5.10 Socioeconomics		
oo.	5.11 Traffic and Transportation		
pp.	App BB Traffic Counts		
qq.	5.12 Noise		
rr.	App CC Noise Measurements		
ss.	5.13 Visual Resources		
tt.	5.14 Waste Management		
uu.	5.15 Haz Mat Handling		
av.	5.16 Public Health and Safety		
ww.	App DD Public Health and Safety Data		
xx.	5.17 Worker Safety		
yy.	5.18 Cumulative Impacts		
zz.	6.0 Financial Information		
aaa.	7.0 List of Preparers		

Exhibit	Brief Description	Offered	Admitted
2.	Application to MDAQMD, dated January 28, 2009, docketed January 28, 2009		
3.	Data Adequacy Supplement, dated April 6, 2009, docketed April 6, 2009		
a.	Responses 1-5 Air Quality		
b.	Response 6 Economic benefits of alternate site		
c.	Responses 7-11 Biology		
d.	Responses 12-23 Cultural		
e.	Responses 24-26 Land Use		
f.	Responses 27-28 Noise		
g.	Responses 29 Project Overview		
h.	Response 30-32 Site ownership		
i.	Response 33 Transmission Line Route		
j.	Response 34-36 Socioeconomics		
k.	Response 37 Fill disposal location		
l.	Response 38 Soils		
m.	Responses 39 Traffic		
n.	Response 40-41 Agency contacts and other permits		
o.	Response 42-44 One-lines and agencies		
p.	Response 45-46 Visual		
q.	Response 47 Waste Management		
r.	Responses 48, 53-55 Surface Water		
s.	Responses 49-52 Groundwater		
t.	Response 50 Back-up water supply		
4.	Additional Information, dated April 29, 2009, docketed April 29, 2009, Pump Test Data		
5.	CEC/BLM Data Responses 49-70, 74, 75, 80, 82-84, 88-91, dated July 17, 2009, docketed July 17, 2009		
a.	Response 49 Alternate site map		
b.	Responses 50-52, Biology, U.S. and State Waters 54-56, 82-84		
c.	Response 53 Evaporation Pond		
d.	Responses 57-60 Hydrogen system		
e.	Response 61 Paleontology		
f.	Responses 62-63 Project boundary		
g.	Responses 64-67 Land use		
h.	Response 68 Noise		

Exhibit	Brief Description	Offered	Admitted
i.	Responses 69-70 Groundwater		
j.	Responses 74,75, Water requirements 80		
k.	Responses 86-87 Waste management and ore processing		
6.	CEC/BLM Response 55 – Raven Monitoring and Control Plan, dated July 17, 2009, docketed July 17, 2009		
7.	CEC/BLM response 50 – Report to Map Federal and State Waters, dated July 17, 2009, docketed July 17, 2009		
8.	CURE Data Request Responses 1-228, dated July 27, 2009, docketed July 27, 2009		
a.	Responses 1-162, 165, Biology 224-228		
b.	Responses 163, 164 SunCatcher washing		
9.	Response to Public Comments, dated July 30, 2009, docketed July 30, 2009		
a.	Response 4 Aquifer recharge		
b.	Responses 5, 6, 17 Public Information		
c.	Response 13 Land Purchases		
d.	Response 14 Siting		
e.	Responses 8-12, 16, 18 Biology		
f.	Response 15 Cumulative Impacts		
g.	Responses 19, 20, Phasing, POD, Access 23-26		
h.	Responses 21, 22, 24 Technology		
10.	CURE data request responses 229-275, dated August 13, 2009, docketed August 13, 2009		
	Responses 229-275 Interconnection, Overloads, Mitigation		
11.	CEC/BLM Responses 113-127, dated August 20, 2009, docketed August 20, 2009		
a.	Responses 113, 114 Economics and fire funding		
b.	Responses 115, 117, Access, site spacing 123,127		
c.	Responses 120, Visual 124-125		
d.	Responses 116, 118, ROW 119, 121, 122,124,126		
12.	CEC/BLM Responses 1-48, 81, 109-112, dated August 31, 2009, docketed August 28, 2009	X	
a.	Responses 1-8, 10, 11, Air 13, 19, 22-29, 31-43, 45-48		
b.	Responses 9, 12, Engineering 14-18, 20, 21, 30, 44		
c.	Responses 109-112 Public Health		
13.	CEC/BLM Response 81, dated August 31, 2009, docketed August 31, 2009 Response 81 DESCP		

Exhibit	Brief Description	Offered	Admitted
14.	CEC/BLM Info Request Responses (9/16/09 workshop), dated October 15, 2009, docketed October 15, 2009		
a.	Soil stabilizer and County contacts		
b.	Use of private parcels		
15.	CURE DR Responses 276-380, dated November 13, 2009, docketed November 12, 2009		
a.	Responses 276-282 Hydrogen		
b.	Response 283-285 BNSF water		
c.	Response 286 Soil testing		
d.	Response 287 Worker Safety		
e.	Responses 288-295 BNSF water		
f.	Responses 296-297, MTBF, emergencies283-285		
g.	Responses 298-303 SunCatcher testing		
h.	Responses 304-306 Delay		
i.	Responses 307-309 Funding		
k.	Responses 310-312 Land Use		
l.	Responses 313-359, Biology361-374, 377-379		
m.	Response 360		
n.	Responses 375, 376, Project description 380		
16.	CEC/BLM DR Responses, Set 1, part 2, dated November 19, 2009, docketed November 19, 2009		
a.	Response 92, 93 Geomorphology		
b.	Response 94-108 Cultural		
17.	CEC/BLM DR Responses 71-73, 76-79, 85, 128-141, dated November 23, 2009, docketed November 23, 2009		
a.	Responses 71-73, Groundwater and aquifer data 77-79, 85		
b.	Response 76, 137, Well location 138, 139		
c.	Responses 128 Geotextile		
d.	Response 129-131, Road assumptions 136, 140		
e.	Response 132-134 Alternatives		
f.	Response 135 Biology impacts		
g.	Response 141 Traffic		
18.	CURE DR Responses 378-402, dated December 2, 2009, docketed December 3, 2009		
a.	Response 378-394 Biology		
b.	Response 395-402 DWMA ACEC Upper Johnson Valley		

Exhibit	Brief Description	Offered	Admitted
19.	DOW and BRW DR Responses, dated December 4, 2009, docketed December 4, 2009		
	DOW Responses 6-8, Alternative sites 11		
a.	DOW Responses 9, 10 Alternatives		
b.	DOW Responses 1-5 Biology		
c.	BRW Responses 1-3 Biology		
20.	CEC/BLM DR Responses, Set 2, dated December 4, 2009, docketed December 4, 2009		
a.	Response 142 Channel grading		
b.	Response 143 Research overview		
c.	Response 144-153 Groundwater		
d.	Response 154-161 Sediment, culverts		
e.	Response 162-166 PCU luminance/mirror visibility		
	Response 167-174 Oil storage, SPCC, waste streams		
21.	Updated project map, dated December 21, 2009, docketed December 21, 2009		
	Project Map Biology		
22.	Donated Parcel Study, dated December 17, 2009, docketed December 17, 2009		
a.	Biology		
b.	Cultural Resources		
c.	Geology		
d.	Soils		
e.	Land Use		
f.	Noise		
g.	Public Health		
h.	Visual Resources		
23.	Project Description for 275 MW Interconnection, dated December 23, 2009, docketed December 23, 2009		
	SCE Description for 275 Interconnection		
24.	Biological Resources Technical Report, Biological Resources Baseline Study, and Noxious Weed Management Plan, dated December 23, 2009, docketed December 23, 2009		
25.	Geotech Engineering Report, dated January 6, 2010, docketed January 8, 2010		
26.	Responses to CURE letter, dated January 7, 2010, docketed January 7, 2010		
	DR 10, 379, 380, 382		
27.	CAISO, Corridor Conflict Analysis, dated January 6, 2010, docketed January 8, 2010		
	Corridor Conflict & BLM letter		

Exhibit	Brief Description	Offered	Admitted
28.	Response to CEC transmission questions, dated January 8, 2010, docketed January 8, 2010		
a.	Items 1-3, 7 Biology		
b.	Items 4, 9 SCE transmission and 11		
c.	Items 5-6 Cultural		
d.	Items 8 & 10, Flood zones 12, 14		
e.	Item 13 BMPs for Erosion		
29.	Additional Alternatives Analysis, dated January 7, 2010, docketed January 8, 2010		
a.	Introduction, Land Use		
b.	Biological Resources		
c.	Cultural Resources		
d.	Water Resources		
30.	Additional Information on Water Supply, dated January 15, 2010, docketed January 15, 2010		
	Field efforts and back-up water supply		
31.	MDAQMD Final Decision, dated January 27, 2010, docketed January 27, 2010		
32.	Supplemental Information, dated January 27, 2010, docketed February 3, 2010		
a.	Sections 1.0 & 1.2 Cadiz water supply		
b.	Section 2.1 Introduction		
c.	Section 2.2 Air Quality		
d.	Section 2.3 Geology		
e.	Section 2.4 Soils		
f.	Section 2.5 Water		
g.	Section 2.6 Biology		
h.	Section 2.7 Cultural		
i.	Section 2.8 Paleontology		
j.	Section 2.9 Land Use		
k.	Section 2.10 Socioeconomics		
l.	Section 2.11 Traffic		
m.	Section 2.12 Noise		
n.	Section 2.13 Visual		
o.	Section 2.14 Waste Management		
p.	Section 2.15 Hazardous Materials		
q.	Section 2.16 Public Health		

Exhibit	Brief Description	Offered	Admitted
r.	Section 2.17 Worker Safety		
s.	Section 2.18 Cumulative		
33.	Response to January 5, 2010 workshop items, dated January 29, 2010, docketed January 29, 2010		
a.	Items 1-4, 6-21, Biology 23-34		
b.	Item 5, 22 Evaporation ponds		
34.	Drainage Layout, dated February 12, 2010, docketed February 12, 2010		
	Drainage Layout		
35.	Construction Milestone Schedule, dated February 12, 2010, docketed February 12, 2010		
	Construction milestones		
36.	Burrowing Owl Survey, dated February 19, 2010, docketed February 13, 2010		
37.	CEC/BLM Responses, dated February 24, 2010, docketed February 24, 2010		
	Response 102 and 103		
38.	LGIA, dated February 26, 2010, docketed February 26, 2010		
39.	Clean Water Act 401 Application and Notification of Lake or Streambed Alteration, dated March 4, 2010, docketed March 4, 2010		
40.	Revised Project Layout, dated March 8, 2010, docketed March 8, 2010		
41.	Existing and Future Access Roads, dated March 8, 2010, docketed March 8, 2010		
42.	Use of Rail to Transport Water, dated March 26, 2010, docketed March 26, 2010		
43.	2010 Burrowing Owl survey results, dated March 26, 2010, docketed March 26, 2010		
44.	Biological Assessment, dated April 1, 2010, docketed April 1, 2010		
45.	Comments on SA/DEIS, dated April 14, 2010, docketed April 14, 2010		
46.	Construction Schedule, dated April 21, 2010, docketed April 21, 2010		
47.	Additional information from April workshop, dated April 20, 2010, docketed April 20, 2010		
a.	Soils		
b.	Access		
c.	Worker Safety		
d.	Efficiency		
e.	Traffic		
48.	Suggested Revised Biological Conditions, dated April 27, 2010, docketed April 27, 2010		
49.	Federal NO2 1-hour Modeling Analysis, dated April 30, 2010, docketed April 30, 2010		
50.	Results from Helicopter Surveys for Golden Eagle Nests/Bighorn Sheep, dated April 30, 2010, docketed April 30, 2010		
51.	Letter pertaining to Glint & Glare, dated April 30, 2010, docketed April 30, 2010		

Exhibit	Brief Description	Offered	Admitted
52.	Additional information, dated May 4, 2010, docketed May 4, 2010		
53.	Department of Army Permit, dated May 6, 2010, docketed May 6, 2010		
54.	2010 Early Spring Botany Survey Results, dated May 20, 2010, docketed May 20, 2010		
55.	2010 Desert Tortoise Survey Results, dated May 18, 2010, docketed May 18, 2010		
56.	Supplement to AFC, dated May 14, 2010, docketed May 14, 2010		
a.	Site boundary		
b.	Hydrogen system		
c.	Water Supply		
57.	Site Layout Alternative #2, dated June 2, 2010, docketed June 2, 2010		
58.	Maricopa Construction and Operation, dated June 11, 2010, docketed June 11, 2010		
59.	Information in Response to 6/4/2010 CEC email, dated June 11, 2010, docketed June 11, 2010		
60.	Additional Information in Response to 6/4/2010 CEC email, dated June 16, 2010, docketed June 16, 2010		
61.	2010 Late Spring Botany Survey Results, dated June 16, 2010, docketed June 16, 2010		
62.	Submittal of Microphyllus Species Distribution, dated June 22, 2010, docketed June 22, 2010		
63.	Opening Direct Testimony for Felicia Bellows	x	8/4/10
64.	Opening Direct Testimony for Sean Gallagher	x	8/4/10
65.	Opening Direct Testimony for Mike Alhalabi		
66.	Opening Direct Testimony for Robert Byall		
67.	Opening Direct Testimony for Noel Casil		
68.	Opening Direct Testimony for Matt Dadswell		
69.	Opening Direct Testimony for Michael Hatch		
70.	Opening Direct Testimony for Shawn Johnston		
71.	Opening Direct Testimony for Angela Leiba		
72.	Opening Direct Testimony for Julie Mitchell		
73.	Opening Direct Testimony for Patrick Mock		
74.	Opening Direct Testimony for Matt Moore		
75.	Opening Direct Testimony for Rachael Nixon		
76.	Opening Direct Testimony for Rick Reiff		
77.	Opening Direct Testimony for Robert Scott		
78.	Opening Direct Testimony for Joe Stewart		
79.	Opening Direct Testimony for Mark Storm		

Exhibit	Brief Description	Offered	Admitted
80.	Opening Direct Testimony for Waymon Votaw		
81.	Opening Direct Testimony for Tricia Winterbauer		
82.	Rebuttal Testimony for Felicia Bellows	x	8/4/10
82-A.	Applicant's Requested Changes to Conditions	x	8/4/10
82-B.	Maps of Pre- and Post-Project Public Access Routes	x	8/4/10
82-C.	Map of Biological Resources Avoided by Project Boundary Modification	x	8/4/10
82-D.	Revised Project Base Map	x	8/4/10
82-E.	July 1, 2010 BNSF letter	x	8/4/10
83.	Rebuttal Testimony for Julie Mitchell		
84.	Rebuttal Testimony for Robert Scott		
84- A.	Map of Wells in the Vicinity of the Calico Solar Project		
85.	Rebuttal Testimony for Joe Liles		
86.	Rebuttal Testimony for Robert Byall		
87.	Rebuttal Testimony for Patrick Mock		
88.	Rebuttal Testimony for Theresa Miller		
89.	Rebuttal Testimony for Waymon Votaw		
90.	Rebuttal Testimony for Tariq Hussain		
90-A.	Map of Offsite Consequences Analysis for Two Independent Centralized Hydrogen Systems		
91.	Rebuttal Testimony for Noel Casil		
92	Proposed changes to conditions Bio 12, Bio 13, and Bio 17.	x	8/6/10
93	Desert Tortoise Relocation plan dated July 28, 2010		
94	Revised version of [Ex. 90]		
95	Final Environmental Impact Statement dated ____.	x	8/6/10
96	Additonal Air Quality Analysis for NO2 (8/4)		
97	Hydrogen Compressor Map		
98	Data sheets for Desert Tortoise translocation plan		
99	Phase 1A Plan and narrative dated _____		
100	Revegetation acreage calculation		
101	Updated detention basin specifications and figures		
102	Abstract of [Study of Ft. Irwin Tortoise Relocation Project]		No
103	Proposed revisions to Cultural Conditions		
104	Proposed revisions to Biological Conditions		

Exhibit	Brief Description	Offered	Admitted
105	IVS Glint and Glare report		No
106	Nixon/Hollanes testimony and resume		
107	Lange testimony and resume		
108	Calico Revised Conditions		
109	Map: Phase 1 fencing information		
110	Response to Staff request for Road information		
111	BLM route maps from West Mojave Plan		
112	Applicant's response to Committee questions		
113	Revised conditions compilation submitted August 26, 2010		
114	Declaration of Felicia Bellows dated 9/13/10		
115	Declaration of Patrick J. Mock, PhD dated 9/13/10		
116	Declaration of Theresa Miller dated 9/13/10		
117	Declaration of Howard H. Chang PhD dated 9/13/10		
118	Declaration of Robert Byall dated 9/13/10		
119	Declaration of Matt Moore dated 9/13/10		
120	Declaration of Rachael Nixon dated 9/13/10		
121	Declaration of Noel Casil dated 9/13/10		
122	Declaration of Matt Dadswell dated 9/13/10		
123	Declaration of Michael Hatch dated 9/13/10		
124	Declaration of Tariq Hussain dated 9/13/10		
125	Declaration of Angela Leiba dated 9/13/10		
126	Declaration of Julie Mitchell dated 9/13/10		
127	Declaration of Joe Stewart dated 9/13/10		
128	Declaration of Mark Storm dated 9/13/10		

Staff's Exhibits

Exhibit	Brief Description	Offered	Admitted
300	Supplemental Staff Assessment		
301	Final Determination of Compliance		
302	"Estimated Location of Fire Facility Cost to Proposed Solar Energy Installations," June 3, 2010, Stanley R. Hoffman Associates (for San Bernardino County Fire Department)		
303	Staff Rebuttal Testimony and first Errata (updating the Biological Resources Section of the SSA and Conditions of Certification BIO 17 and BIO 18), July 29, 2010.		

Exhibit	Brief Description	Offered	Admitted
304	[Identification of future transmission system upgrades.]		
305	Appendix A, Biological Resources		
306	Soil and Water Figures 5A and 5B		
307	Staff proposed revisions to Condition AQ-SC9		
308	Staff proposed revision to Conditions Noise-1, etc.		
309	Supplemental Staff Assessment, Part 2, dated August 9, 2010		
310	Second errata to Supplemental Staff Assessment		
311	8/25/10 letter from Wayne Donaldson to Roxie Trost		
312	Cultural-4 Condition insert		
313	Staff response to Committee questions		
314	Tonya Moore email to Chris Huntley		
315	Revisions to Worker Safety-6		
316	Revisions to Haz-8		
317	Supplemental Staff Assessment Addendum dated September, 2010		

Intervenor CURE

Exhibit	Brief Description	Offered	Admitted
400	Opening Testimony of David Marcus on Behalf of California Unions for Reliable Energy on Transmission for the Calico Solar Project		
401	Marcus Declaration		
402	Marcus c.v.		
403	131 FERC 61,071, Docket ER10-796, order issued April 26, 2010		
404	(No Exhibit)		
405	Rebuttal Testimony of Boris Poff on Behalf of California Unions for Reliable Energy on Soil and Water for the Calico Solar Project		
406	Poff c.v.		
407	McFadden, Wells, Jercinovich, Department of Geology, Univ. of New Mexico, Influences of eolian and pedogenic processes on the origin and evolution of desert pavements		
408	Seager, Ting, Held, Kushnir, et al., Model Projections of an Imminent Transition to a More Arid Climate in Southwestern North America Soil/Water Boris Poff		
409	Okin, Murray, Schlesinger, Degradation of sandy arid shrubland environments: observations, process modeling, and management implications		
410	Okin, Gillette, Herrick, Multi-scale controls on and consequences of Aeolian processes in landscape change in arid and semi-arid Environments		

Exhibit	Brief Description	Offered	Admitted
411	Angel, Palecki, Hollinger, Storm Precipitation in the United States. Part II: Soil Erosion Characteristics		
412	Anderson, Wells, Graham, Pedogenesis of Vesicular Horizons, Cima Volcanic Field, Mojave Desert, California		
413	Rebuttal Testimony of Vernon C. Bleich on Biological for the Calico Solar Project		
414	Bleich c.v.		
415	Bleich, Wejaisem. Ramey, Rechel: Metapopulation Theory and Mountain Sheep: Implications for Conservation		
416	Epps, Wehausen, Bleich, Torres, Brashares: Optimizing dispersal and corridor models using landscape genetics		
417	Wehausen: Nutrient predictability, birthing seasons, and lamb recruitment for desert bighorn sheep		
418	Oehler, Bleich, Bowyer, Nicholson: Mountain Sheep and Mining: Implications for Conservation and Management		
419	Schwartz, Bleich, Holl: Genetics and the Conservation of Mountain Sheep		
420	Belich, Wehausen, Holl: Desert-dwelling Mountain Sheep: Conservation Implications of a Naturally Fragmented Distribution		
421	Bleich, Bowyer, Wehausen: Sexual Segregation in Mountain Sheep: Resources or Predation?		
422	Epps, Wehausen, Palsoboll, McCullough: Using Genetic Tools to Track Desert Bighorn Sheep Colonizations		
423	Torres, Mulchahy, Gonzales, Pauli, Andrew: Human Induced Migration and Homing Behavior of a Desert Bighorn Ram in the Whipple Mountains, California: Or Herman the Trailer Park Ram		
424	Rebuttal Testimony of Scott Cashen on Biology for the Calico Solar Project		
425	Cashen c.v.		
426	Belnap, Webb, Miller, et al.: Monitoring Ecosystem Quality and Function in Arid Settings of the Mojave Desert		
427	California Partners in Flight and PRBO Conservation Science: The Desert Bird Conservation Plan, a Strategy for Protecting and Managing Desert Habitats and Associated Bids in the Mojave and Colorado Deserts		
428	U.S. Department of the Interior, USGS: Threats to Desert Tortoise Populations: A Critical Review of the Literature		
429	U.S. Department of the Interior, USGS: Modeling Habitat of the Desert Tortoise (Gopherus agassizii) in the Mojave and Parts of Biology Scott Cashen 2309-080a 12 the Sonoran Deserts of California, Nevada, Utah and Arizona		

Exhibit	Brief Description	Offered	Admitted
430	Pagel, Whittington, Allen: Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations		
431	Marzluff, Knick, Vekasky, Schuek, Zarriello: Spatial Use and Habitat Selection of Golden Eagles in Southwestern Idaho		
432	Survey Protocols Required for NEPA/ESA Compliance for BLM Special Status Plant Species		
433	Okin, Murray, Schlesinger: Degradation of sandy arid shrubland environments: observations, process modeling, and management implications		
434	Record of Decision, West Mojave Plan, Amendment to the California Desert Conservation Area Plan		
435	U.S. Dept. of Interior: Effects of the International Boundary Pedestrian Fence in the Vicinity of Lukeville, Arizona, on Drainage Systems and Infrastructure, Organ Pipe Cactus National Monument, Arizon		
436	U.S. Fish and Wildlife Service: Final Environmental Assessment, Proposal to permit Take as provided Under the Bald and Golden Eagle Protection Act		
437	Southern California Edison act three overview map for the Calico Solar Project.	x	8/4/10
438	Memorandum from Christopher Meyer to Felicia Bellows and Bob Therkelsen re: SES Solar One Project—Transmission Line Upgrades		
439	2008 and 2009 Annual Reports for the Fort Irwin Translocation Project. [authors], undated		
440	Bighorn Habitat Connectivity Map		
441	8/16/10 Rebuttal Testimony of David S. Whitley on Behalf of the California Unions for Reliable Energy on Cultural Resources forthe Calico Solar Project (c.v. and declaration)		
442	2001 Desert Pavement and Buried Archaeological Feature in the Arid West: A Case Study from Southern Arizona		
443	Testimony of Scott Cashen on the Desert Tortoise Translocation Plan or the Calico Solar Project dated August 17, 2010.		
444	Desert Tortoise Council Abstracts 33 **1d** Annual Meeting and Symposium Biology Scott Cashen		
445	Desert Tortoise Council Abstracts 34th Annual Meeting and Symposium Biology Scott Cashen		
446	2/2010 Desert Tortoise Council Abstracts 35 th Annual Meeting and Symposium Biology Scott Cashen		

Exhibit	Brief Description	Offered	Admitted
447	4/2/09 US Dept. of the Army, Memorandum for Desert Tortoise Recovery Coordinator, re Fort Irwin FISS Depredation Biology Scott Cashen		
448	7/29/05 T. Esque, K. Nussear, P. Medica, Desert Tortoise Translocation Plan for Fort Irwin's Land Expansion Program at the U.S. Army National Training Center (NTC) & Fort Irwin - Biology Scott Cashen		
449	5/1/09 T. Esque, K. Nussear, K. Drake, K. Berry, P. Medica, J.Heaton, Amendment to Desert Tortoise Translocation Plan for Fort Irwin's Land Expansion Program at the U.S. Army National Training Center (NTC) & Fort Irwin Biology Scott Cashen		
450	Spring 2010 - Calico Solar Desert Tortoise Translocation Plan Recipient Site Photograph; Photograph #4: Long Distance DWMA Translocation Area Biology Scott Cashen		
451	K.H. Berry, Draft Decision for Short-Distance Translocation of Desert Tortoises Biology Scott Cashen		
452	Single Factor ANOVA Model and Tests, Control Treatment Biology Scott Cashen		
453	K. Berry, M. Christopher, Guidelines for the Field Evaluation of Desert Tortoise Health and Disease Biology Scott Cashen		
454	812540 —TestimonyS-cooftto-Cn-aDsheensert-Tortoise-Impacts-in--Staffs —Scott Cashen Errata #2 Biology		
455	K.E. Nussear, T.C. Esque, D.F. Haines, C.R. Tracy, Desert•Tortoise Hibernation: Temperatures, Timing and Environment Biology Scott Cashen		
456	C.H. Ernst, J.E. Lovich, Turtles of the United States and Canada		
457	J.M. Germano, P.J. Bishop, Suitability of Amphibians		
458	J.S. Heaton, et al., Spatially explicit decision support for selecting translocation areas for Mojave desert tortoises		
459	9/14/04 Redlands Institute Decision Support Team, Habitat Potential Knowledge Base (cover and pp. 30-32)		
460	Adaptive Management Working Group, The U.S. Dept. of the Interior Technical Guide, 2009 ed., Chapter 1		
461	9/17/10 Additional Rebuttal Testimony of Scott Cashen on Behalf of the California Unions for Reliable Energy on the Applicant's Proposed Scenarios 5.5 and 6 for the Calico Solar Project (c.v.) Biology Scott Cashen		
462	2007 K.E. Nussear, T.C. Esque, D.F. Haines, C.R. Tracy, Desert Tortoise Hibernation: Temperatures, Timing, and EnvironmentBiology Scott Cashen		

Exhibit	Brief Description	Offered	Admitted
463	8/2008 Public Review Draft Recommendations of Independent Science Advisors for The California Desert Renewable Energy Conservation Plan (DRECP)		
464	2007 K.E. Nussear, C.R. Tracy, Can Modeling Improve Estimation of Desert Tortoise Population Densities? (Ecological Applicationspp.579-586)		
465	9/17/10 Additional Rebuttal Testimony of David S. Whitley on Behalf of the California Unions for Reliable Energy on Cultural Resources for the Calico Solar Project		

Intervenor Defenders of Wildlife

Exhibit	Brief Description	Offered	Admitted
600	Rebuttal Testimony of James M. Andre 7/29/2010		
601	Rebuttal Testimony of Jeff Aardahl 7/29/2010		
602	Revision of Disease Testing Requirements Based on Translocation Distance, Desert Tortoise Recovery Office 7/2010		
603	Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.		
604	Habitat Use and Food Preferences of the Desert Tortoise, *Gopherus agassizii*, in the Western Mojave Desert and Impacts of Off-Road Vehicles. Proceedings of the New York Turtle and Tortoise Society: Conservation, Restoration, and Management of Tortoises and turtles - An International Conference, pp. 42–45.		
605	Applicant's Responses to Defenders of Wildlife Data Requests Set 1. 12/4/2009		
606	Zitzer, S., King, J., and Etyemezian, V., 2008. *Unveiling the mysterious ecology of a rare relict Mojave Desert forb (Penstemon albomarginatus): Will ecological knowledge put a damper on exponential growth in Southern Nevada?* Report for 93rd Ecological Society of American Annual Meeting.		
607	Scogin, R. 1989. Studies of *Penstemon albomarginatus* in California. Report for Rancho Santa Ana Botanic Garden, Claremont, California.		
608	CPUC Phase I direct testimony of Dr. Barry Butler, CPUC Application 06-08-010 6/1/2007		

Exhibit	Brief Description	Offered	Admitted
609	T. Mancini, P. Heller, B. Butler, B. Osborn, W. Schiel, V. Goldberg, R. Buck, R. Diver, C. Andraka, J. Moreno, *Dish-Stirling Systems: An Overview of Development and Status*, Journal of Solar Energy Engineering, Vol. 125, pp. 135-151, May 2003.		
610	**Schwartz**, O.A., V.C. Bleich, and S.A. Holl. 1986. **Genetics and the conservation of mountain sheep Ovis canadensis nelsoni**. Biol. **Conserv.** 37:179-190.		
611	Epps, C. W., P. J. Palsbøll, J. D. Wehausen, G. K. Roderick, R. R.Ramey, D. R. McCullough, 2005. Highways block gene flow and cause a rapid decline in genetic diversity of desert bighorn sheep. Ecology Letters, (2005) 8: 1029–1038.		
612	Fish and Wildlife Service. 1994. Desert tortoise (Mojave population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. 73 pages plus appendices		
613	Abstracts, Thirty-fifth Annual Meeting and Symposium, The Desert Tortoise Council, February 25-28, 2010.		
614	Picture of Desert Tortoise observed on site by DOW staff.		
615	Bureau of Land Management, 2005. West Mojave Plan: A Habitat Conservation Plan and California Desert Conservation Area Plan Amendment. California Desert District, Moreno Valley, CA. Page 2-116.		
616	Palen Connectivity Study for CEC		
617	Culvert Photograph #1.JPG		
618	Culvert Photograph #2.JPG		
619	Ram Skeleton Photograph		
620	Testimony of Jeff Aardahl		

Intervenor Basin and Range Watch

Exhibit	Brief Description	Offered	Admitted
800	Informal survey tracks and photographs at Calico Solar Project site, San Bernardino County, California.	X	9/20/10
801	Mojave fringe-toed lizard habitat at Ford Dry Lake area, Riverside County, California.	X	X
802	Satellite imagery of sand in the Calico Project Site area.	X	X
803	Visual summary of Impacts from the Calico Project.	X	X
804	Supplemental Testimony by Kevin Emmerich.	X	X

Intervenor Sierra Club

Exhibit	Brief Description	Offered	Admitted
1000	Photo of Nelson's Bighorn Sheep	X	X
1001	Photo of Nelson's Bighorn Sheep	X	X
1002	Photo of Golden Eagle	X	X
1003	Photo of Golden Eagle	X	X
1004	Photo of Desert Tortoise	X	X
1005	Photo of Desert Tortoise	X	X
1007	Photo of White-margined beardtongue	X	X
1008	Photo of Mojave fringe-toed lizard	X	X
1009	Photo of Mojave fringe-toed lizard	X	X
1010	Calico Project Site Map	X	X
1011	Photograph		
1012	Photograph		
1013	Photograph		
1014	Photograph		
1015	Photograph		
1016	Photograph		
1017	Photograph		
1018	Photograph		
1019	Photograph		
1020	Untitled map	X	X
1021	Letter from Raymond Lee, Field Manager, BLM to Todd Stewart, Brightsource Energy dated April 8, 2008 with attachment: Comments/Observations on Ivanpah SEGS Sormwater Manaement	X	X
1022	Live Tortoise Encounter Form dated 4/4/10; URS Corp. Calico Solar 2010 Desert Tortoise Protocol Transect Survey dated 3/30/10	X	X
1023	Calico Solar Tortoise Burrow Data dated ____	X	X

Intervenor Newberry Community Services District

Exhibit	Brief Description	Offered	Admitted
1100	Rebuttal Testimony – Newberry CSD		
1101	San Bernardino County LAFCO Fire Districts Map		
1102	San Bernardino County LAFCO Newberry CSD Boundary Map		
1103	Location Reference Map Newberry CSD & Project Site Western Boundary		
1104	SB County Fire – North Desert Division Site Map		
1105	Newberry Springs Fire Department Incident Response Statistics		

Intervenor BNSF Railway Company

Exhibit	Brief Description	Offered	Admitted
1200	Prepared Direct Testimony of Dennis Skeel		
1201	Prepared Direct Testimony of Edward P. Phillips		
1202	Prepared Direct Testimony of Thomas Schmidt		
1203	Prepared Direct Testimony of Joseph Schnell		
1204	Prepared Direct Testimony of Dennis Skeels		
1205	Prepared Direct Testimony of Dr. David Krauss		
1206	Prepared Direct Testimony of Edward P. Phillips dated 8/17/10		
1207	7/1/2010 letter comments to BLM and CEC		
1208	7/29/2010 letter comments to BLM and CEC		
1209	Proposed changes to Conditions TLSN-5, etc.		
1210	General Code of (Railway) Operating Rules		
1211	Prepared Direct Testimony of Douglas Hamilton and Exhibits (Attachments 1 – 7)		
1212	Prepared Direct Testimony of Steven Metro		
1213	Prepared Direct Testimony of David Miller		
1214	Individual Suncatcher locations imposed on terrain map showing washes by Mr. Metro		

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
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APPLICATION FOR CERTIFICATION
For the CALICO SOLAR (Formerly SES Solar One)

Docket No. 08-AFC-13

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DECLARATION OF SERVICE

I, _____, declare that on _____ , 2010, I served and filed copies of the attached _____, dated _____, 2010. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [www.energy.ca.gov/sitingcases/solarone].

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

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____ sent electronically to all email addresses on the Proof of Service list;

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CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-13
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

_____